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FROM THE

NITED STATES NATIONAL HERBARIUM

VOLUME VIII, PART 4

STUDIES OF MEXICAN AND CENTRAL AMERICAN PLANTS—No. 4

By J. N. ROSE

WASHINGTON
GOVERNMENT PRINTING OFFICE
1905

MEXICAN, CENTRAL AMERICAN, AND
PORTO RICAN PLANTS

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The United States National Herbarium, which was founded by the Smithsonian Institution, was transferred in the year 1868 to the Department of Agriculture, and continued to be maintained by that Department until July 1, 1896, when it was returned to the official custody of the Smithsonian Institution. The Department of Agriculture, however, continued to publish the series of botanical reports entitled "Contributions from the United States National Herbarium," begun in the year 1890, until, on July 1, 1902, the National Museum, in pursuance of an act of Congress, assumed responsibility for the publication. The first seven volumes of the series were issued by the Department of Agriculture.

RICHARD RATHBUN,
Acting Secretary of the Smithsonian Institution.

MEXICAN, CENTRAL AMERICAN, AND PORTO RICAN PLANTS

ADVERTISEMENT.

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RICHARD RATHBUN,
Acting Secretary of the Smithsonian Institution.

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UNITED STATES NATIONAL MUSEUM

CONTRIBUTIONS

FROM THE

UNITED STATES NATIONAL HERBARIUM

VOLUME VIII

MEXICAN, CENTRAL AMERICAN, AND PORTO RICAN PLANTS

ROSE, COOK and COLLINS, MAXON

WASHINGTON
GOVERNMENT PRINTING OFFICE
1903-1905

NOTE.

The four parts of Volume VIII of the Contributions were published as follows.

Part 1, pp. 1 to 56, June 16, 1903.
Part 2, pp. 57 to 270, June 27, 1903.
Part 3, pp. 271 to 280, June 27, 1903.
Part 4, pp. 281 to 339, April 20, 1905.

PREFACE.

In the act of Congress making appropriation for the Department of Agriculture for the fiscal year ending June 30, 1889, provision was made for botanical exploration and the collecting of plants in little known districts of America. The results of the work carried on under this and later appropriations for similar purposes, both in the Department of Agriculture and in the National Museum, have been published from time to time in the Contributions from the United States National Herbarium.

Two of these papers included in the present volume are a continuation of the researches of Dr. J. N. Rose on the flora of Mexico, a partial result of his third and fourth journeys to that country, which have enabled him to supplement his critical herbarium studies by valuable field observations. Throughout the progress of the work the scientific value of this field experience has been manifest and the wisdom of the Museum's policy of giving the critical student opportunities of this kind has been fully confirmed.

The extension of American jurisdiction over Porto Rico and the Philippine Islands in the year 1898 created a demand for information regarding the plants of those islands. Both areas contained a tropical flora, and American botanists had devoted little attention to the study of tropical plants. The information demanded regarding the Porto Rican flora was largely of a popular and commercial character and was not at all to be satisfied by the existing and available technical works on the West Indian flora. In the course of their investigations on tropical agricultural plants in Porto Rico, Mr. Cook and Mr. Collins collated a large amount of information on the economic plants of that island such as was not suitable for incorporation in their detailed reports on staple and special agricultural plants, which are published by the United States Department of Agriculture. This information has been brought together in the paper on Economic Plants of Porto Rico, included in this volume. Fortunately the plant names in use among the people of Porto Rico are applied with approximate precision, so that by adding the botanical identification of a plant to its Porto Rican popular name we have in most instances a direct key to its botanical name and position. Furthermore, the use of illustrations reproduced from good photographs conveys in a simple and direct way information which no amount of technical description could replace.

FREDERICK V. COVILLE,
Curator of the United States National Herbarium.

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FROM THE

UNITED STATES NATIONAL HERBARIUM

VOLUME VIII, PART 1

STUDIES OF MEXICAN AND CENTRAL AMERICAN PLANTS—No. 3

By J. N. ROSE

WASHINGTON
GOVERNMENT PRINTING OFFICE
1903

NOTE.

Issued June 16, 1903.

PREFACE.

In the act of Congress making appropriation for the Department of Agriculture for the fiscal year ending June 30, 1889, provision was made for botanical exploration and the collecting of plants in little-known districts of America. In the following year began the publication of reports on this work, under the general title, Contributions from the U. S. National Herbarium. From 1890 to 1902 seven volumes were published. The present paper, the first to be issued since the transfer of the Contributions from the Department of Agriculture to the United States National Museum, is a continuation of Dr. J. N. Rose's researches on the flora of Mexico, the earlier parts of which appeared in the fifth volume of the Contributions. Dr. Rose began his work on Mexican plants in 1889, and, besides examining several collections made by others, he has himself made three journeys to Mexico, which have enabled him to supplement his critical herbarium studies by valuable field observations. All the types and a full set of the other specimens on which the paper is based are deposited in the U. S. National Herbarium, now a part of the collections of the U. S. National Museum.

FREDERICK V. COVILLE,
Curator of Botany.

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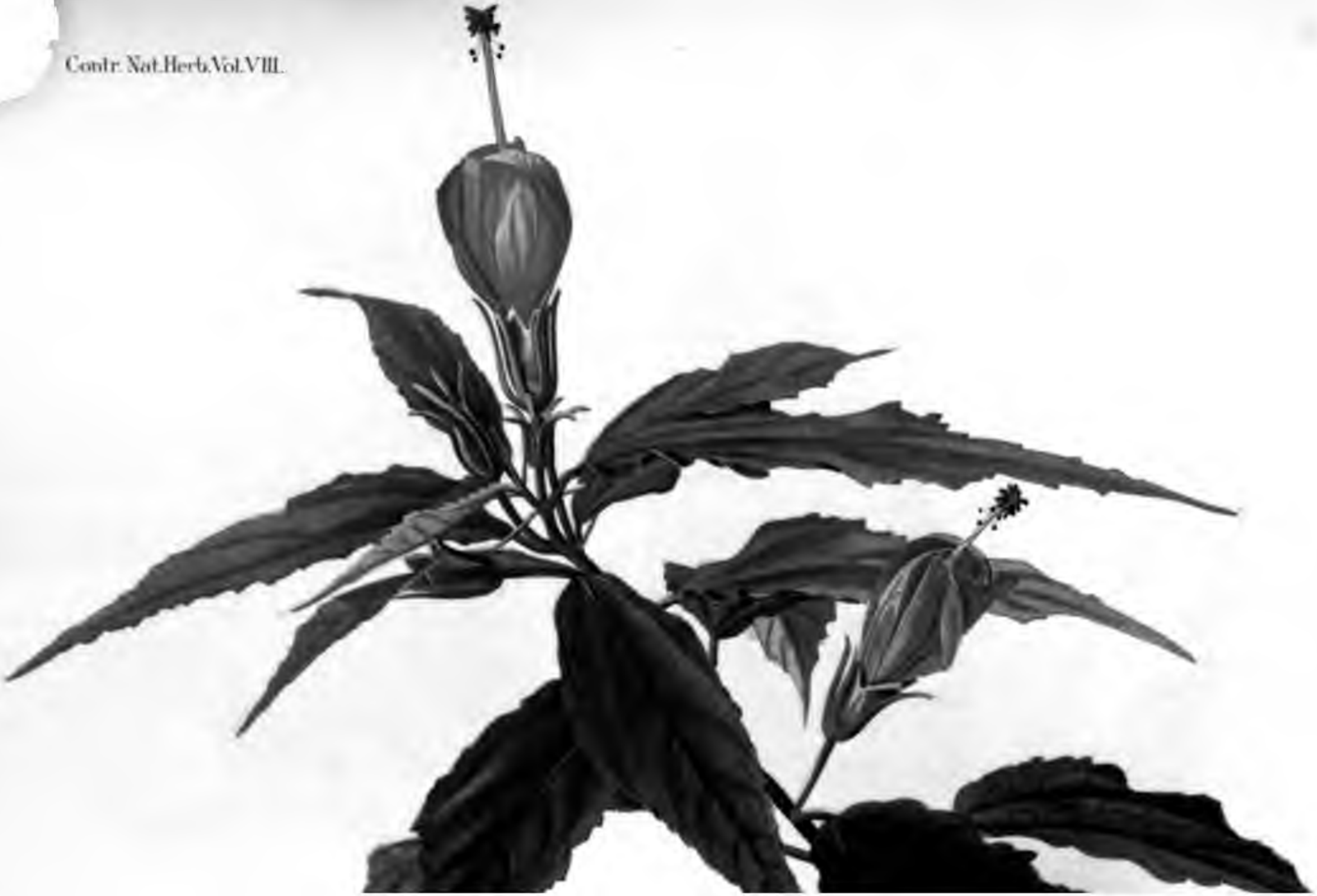
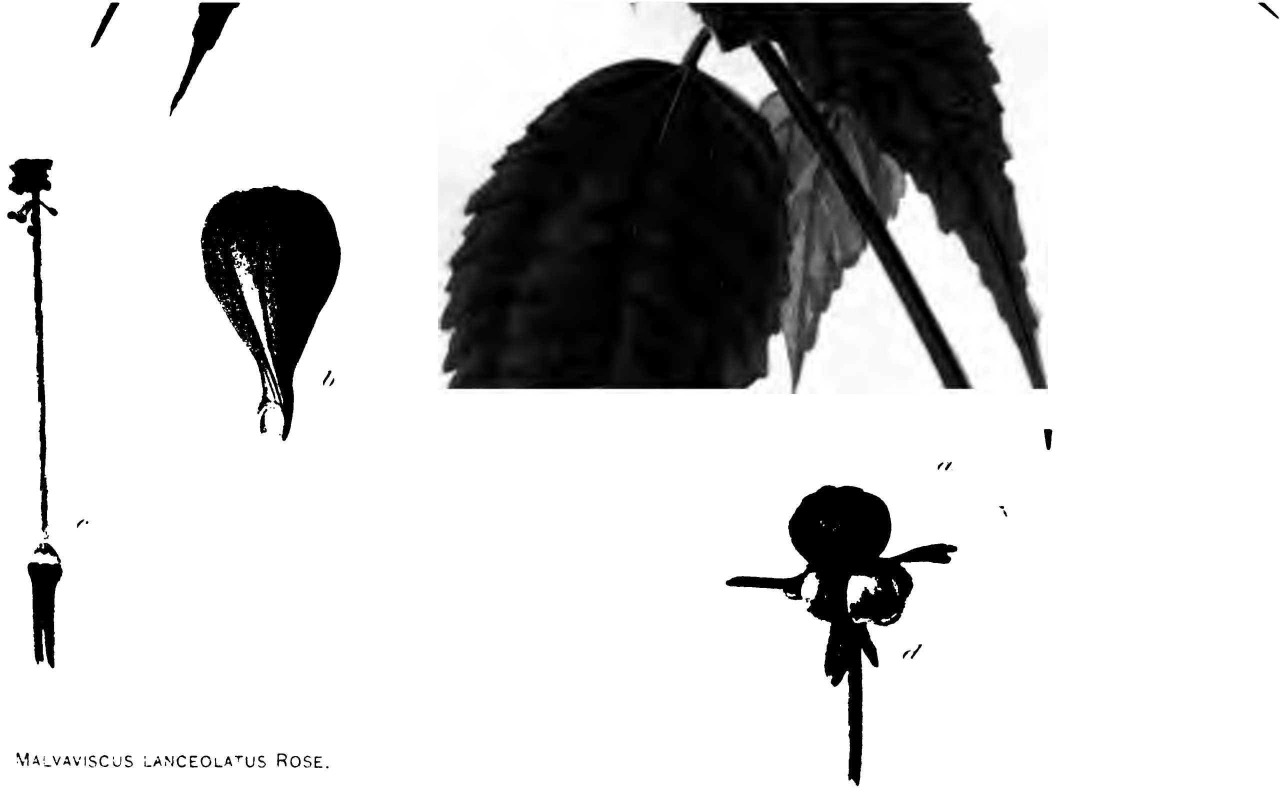
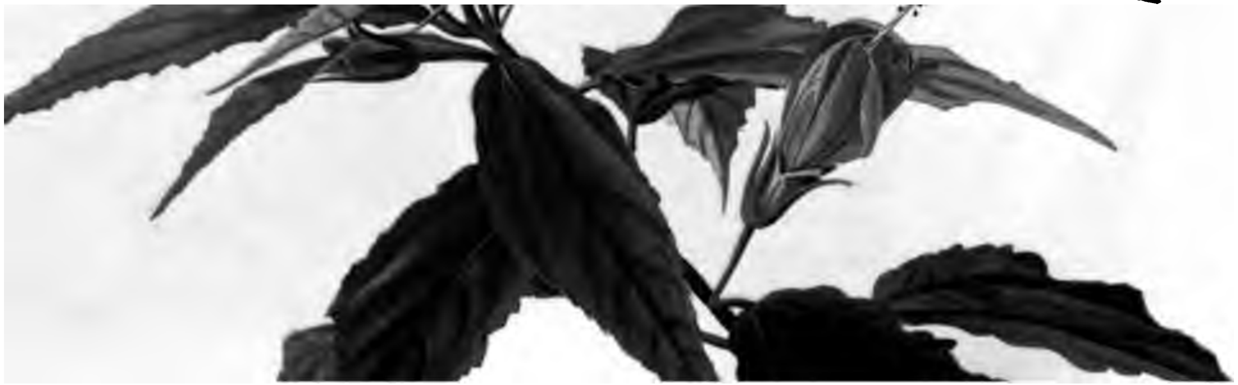
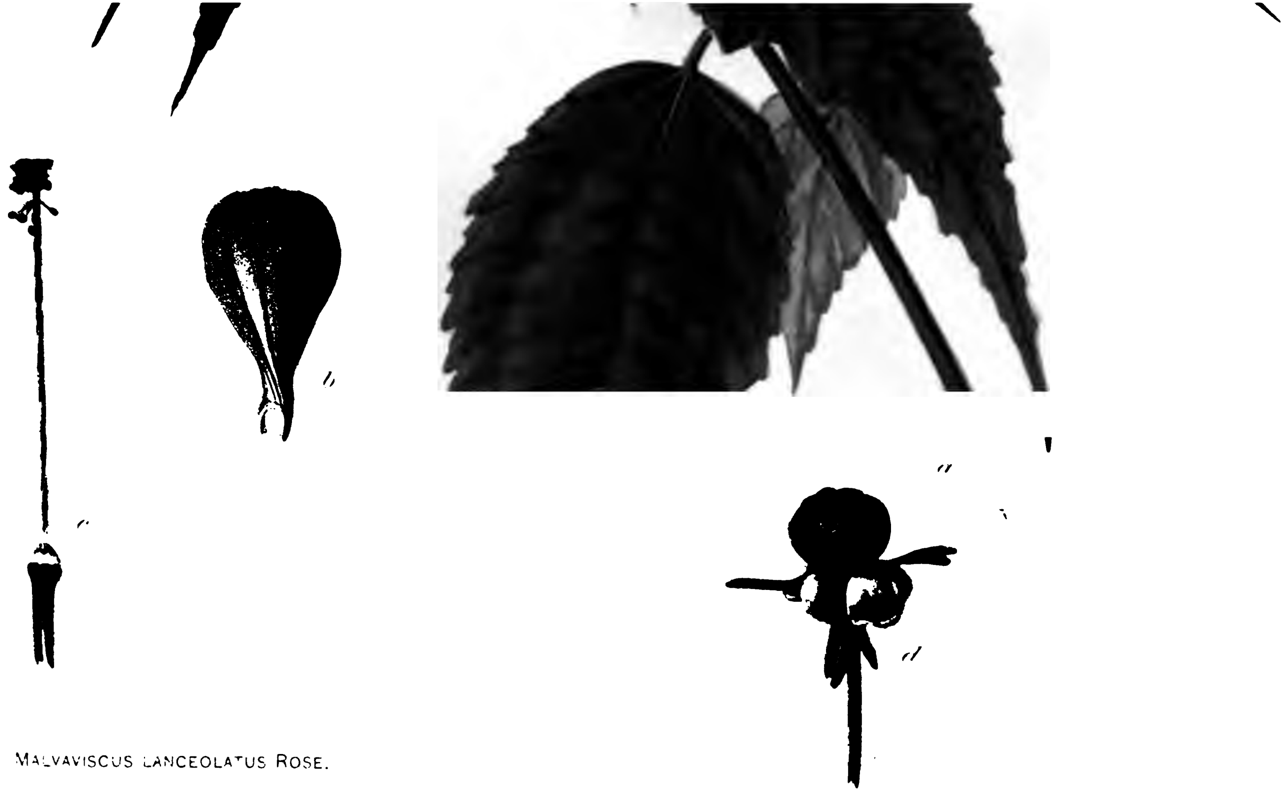




MALVAVISCUS LANCEOLATUS ROSE.





MALVAVISCUS LANCEOLATUS ROSE.

STUDIES OF MEXICAN AND CENTRAL AMERICAN PLANTS—NO. 3.

By J. N. Rose.

INTRODUCTORY NOTE.

These studies are a continuation of those published in the fifth volume of these Contributions and are based chiefly on the collections there referred to.

It embraces also a part of the results of the writer's second and third journeys in Mexico. My second journey was made in company with Dr. Walter Hough, of the United States National Museum, and extended over a period of more than two months (May 9 to July 15, 1899). At this time collections were made in the States of Chihuahua, Aguas Calientes, Mexico, Jalisco, Puebla, Vera Cruz, Hidalgo, and Oaxaca.

The third journey was made in company with Robert Hay, then of this Division, and extended over a period of two months (June 26 to August 31, 1901). Collections were made in most of the same States as were visited on the second journey. Mount Orizaba and Popocatepetl were both visited and extensive collections made on them. None of the plants from these mountains are mentioned herein, as it is intended to present them in a paper on the high-mountain flora of Mexico.

The herbarium material collected during the second and third journeys embraces more than 2,200 numbers (Nos. 4201-6416).

Besides the herbarium specimens many consignments of bulbs, roots, and seeds were sent to Washington, some going to the National Botanic Garden, and others to the Department of Agriculture.

Most of these have lived and a considerable number have flowered, as will be seen from the accompanying table.

Mr. Rose's plants which have flowered in Washington.

Name.	Date of flowering.	Catalogue number.
Argemone platyceras Link & Otto	July 6, 1900	4730
Argemone ochroleuca Sweet	1900	4552
Argemone grandiflora Sweet	Aug. 15, 1900	4884
Begonia gracilis H. B. K	Oct. 15, 1901	6397
Bomaria ovata Mirbel	Dec., 1899	4607
Crinum sp. nov	Aug., 1900 and 1902.	5209

Mr. Rose's plants which have flowered in Washington—Continued.

Name.	Date of flowering.	Catalogue number.
Cotyledon parviflora Hemsl	Aug., 1902	5209
Cotyledon (?) sp	Dec., 1902	6417
Cotyledon (?) sp. nov	1902	5608
Cotyledon (?) *batesii* Hemsl	1902	6413
Echeveria glauca Baker	Sept. 7, 1899	6390
Echeveria racemosa Cham. & Schlecht	Sept. 7, 1902	6124
Echeveria-like plant	1902	6073
Echeveria sp. nov	Feb., 1902	6393
Echeveria sp. nov	Sept. 7, 1899	6391
Echeveria sp. nov	June 15, 1899, and Feb. 7, 1901.	4994
Echeveria sp. nov	June 15, 1902	6412
Epidendrum vitellinum Lindl	June 15, 1901	6193
Hymenocallis sp	Apr., 1900	4640
Mamillaria carnea Zucc	Apr. 19, 1900	4993
Mamillaria sp	Sept. 27, 1899	68
Mamillaria sp	Apr., 1902	101
Mamillaria sp	1902	100
Mamillaria sp	1902	108
Mamillaria sp	1902	284
Manfreda jaliscana Rose, sp. nov	Apr., 1900	109
Oxalis sp. nov	Aug. and Oct. 15, 1900.	1508
Oxalis tetraphylla Cav. (?)	May 21, 1900, and Sept., 1899.	4401
Polianthes platyphylla Rose, sp. nov	Aug. and Oct., 1899.	2598
Sedum sp. nov	July 3, 1900	4996
Sedum sp. nov	Dec. 1, 1901	6395
Sedum ebracteatum DC	Nov. 4, 1901	6396
Talinum crassifolium Willd	Sept. 9, 1899	76
Talinopsis frutescens Gray	Nov., 1901	6378
Tillandsia fasciculata Swartz	Oct. 15, 1901	6122
Tillandsia vestita Cham. & Schlecht	1901	6398
Tillandsia sp. nov	June 2, 1900	4995
Tillandsia sp	May, 1901	3015
Tradescantia crassifolia Cav	Oct. 22, 1900	4782
Tradescantia sp	1900	4681
Zephyranthes carinata Herb	Apr., 1900	4247

NOTE.—In this table all the low numbers (under 200) refer to greenhouse tags. In these cases no herbarium specimens have yet been made.

My collections, while rich in new species and typonyms, contain also considerable material of horticultural interest.

Among the new species which deserve special mention in this connection are the following:

(1) A large white-flowered Crinum found in a swamp near Cuernavaca. This species was collected in 1899 and has flowered three times in the National Botanic Garden. One fine bulb has been sent to Kew.

(2) Two species of Polianthes. These were both collected in the market place at Guadalajara where they are brought in by the Indians and sold under the name of "nardo." One has long slender flowers, much longer than those of its relative the well-known tuberose, while the other has small flowers but produced in dense clusters. Both species deserve a place in every first-class bulb collection. They will be found described elsewhere in this paper.

(3) Several species of Echeveria. Although many species of this genus have been introduced into cultivation from Mexico several choice ones still remain. Two of those which I brought back are very promising. These will be described in a succeeding paper.

Scarcely less interesting than the new species are several rediscoveries of horticultural plants.

(1) First that of *Heeria elegans*. This is a dainty little trailer forming a dense carpet and it may perhaps be profitably employed in this manner. Living material was sent to the Garden at Museo Nacional, city of Mexico, and to the Department of Agriculture, Washington, D. C. The latter material has not flowered or flourished very well, but it is hoped that better results will be obtained next year. This species is very unlike the various species of Heeria now in cultivation and in the writer's opinion is probably not congeneric with them.

(2) Four species of Argemone. The most interesting of these is *A. platyceras*. As is shown elsewhere, this is not the so-called *Argemone platyceras* of the United States, but probably the true form. The plant grows in mountainous regions and will probably live throughout the year in our Northern States. The plant seeds freely and young self-sown plantlets in Washington were still alive at Christmas time, although growing in the open. *Argemone grandiflora*, although well known in cultivation, is rare in collections. Mr. Prain, who has examined all the larger herbaria of Europe, states that he found but a single specimen which was not from cultivated material. I found this species very common in the State of San Luis Potosi, where it was seen along the Tampico branch of the Mexican Central Railway for a stretch of 50 miles. *A. mexicana* and *A. ochroleuca* have both been flowered in the Botanic Garden.

(3) Various species of Lupinus. A great many kinds of lupine were collected in entral Mexico, but the season was not the proper one to gather seed. I expect to collect seed of several of these spe-

cies for distribution on my next visit to that region. Among the most promising are *mexicanus*, *montanus*, *vaginatus*, *elegans*, and *bakeri*.

(4) Several species of Cotyledon or better Echeveria. *Echeveria glauca* and *E. secunda* were collected wild. These two are certainly specifically distinct. *E. racemosa* (*E. lurida*) was obtained at its type locality. This species has not recently been in cultivation. It forms dense rosettes of bronzed leaves and may prove a valuable bedding plant. *Cotyledon parviflora* and several closely related species were collected. These are too insignificant to be of much horticultural interest. They are, however, so very different both from Echeveria and Cotyledon that no one who has seen them growing would protest against their separation as a new generic type.

(5) *Ampelocissus acapulcensis.* This plant, first described by Kunth as a true Vitis, is known to the Mexican to-day under the popular name of uva or grape. It differs strikingly from all our true grapes in having a herbaceous stem which dies down to the ground each year. It must possess an enormous root, as it produces vines of great length. In my plants, grown from seed, a cluster of fleshy roots somewhat similar to sweet potatoes is formed at the end of the first year. The fruit is borne in large bunches sometimes a foot long. The individual grapes, wine-colored when ripe, are about the size of the common fox grape of the Eastern United States, sometimes larger, even three-fourths of an inch in diameter. Seeds were sent to Washington and turned over to Mr. George W. Oliver of the Department of Agriculture, who now has a number of plants. He has also made some successful grafts upon *Vitis vinifera*, but it is too early to predict any definite results. The Mexicans about Yautepec, State of Morelos, bring the fruit into the market places during May, June, and July, selling it under the name of "uva sylvestra." From it a kind of "dulce" is made. Mr. C. G. Pringle called my attention to this vine, and it was through his assistance that I was able to procure material.

In the first of these Studies I published a description of *Malvaviscus lanceolatus*, calling attention to the fact that we had living plants in the greenhouse of the Department of Agriculture. From one of these plants a colored drawing has been made, which forms the frontispiece of this report. Numerous cuttings have been made, and that Department will be able to furnish a limited number of plants to botanical gardens which apply for them. In Washington this species begins to flower about the 1st of January and soon afterwards is covered with a mass of flowers.

It is often desirable to know the exact specimens from which an illustration has been made. For this reason I have compiled here all necessary information in this regard for the illustrations used in this report.

Data concerning specimens used for illustrations.

Name of species.	Locality.	Collector.	Nos.	Date.	Herbarium No.
Pl. I. *Malvaviscus lanceolatus* ..	Chicharras	Nelson ..	3807	1896	....
II. *Neotreleasea brevifolia* ...	....	....	......	......	....
III. *Potentilla rydbergiana* ...	Mountains near Pachuca.	Pringle ..	7646	1898	371990
IV. *Potentilla madrensis*	Mountains of Tepic.	Rose	2096	1897	300996
V. *Cologania capitata*	.....do	....do ...	3459	1897	302438
VI. *Crotalaria viminalis*	Cuernavaca	....do ...	4341	1899	346293
VII. *Lupinus submontanus* ...	Mount Orizaba	....do ...	5673	1901	395448
VIII. *Indigofera platycarpa* ...	Near Iguala	Pringle ..	8399	1900	396660
IX. *Phaseolus oaxacanus*	On Sierra de San Felipe.	....do ...	5814a	1894	372011
X. *Phaseolus pedatus*	Near Iguala	....do ...	8367	1900	371916
XI. *Colubrina megacarpa*	Near Tehuacan	Rose	5852	1901	395639
XII. *Saurauja pringlei*	Sierra de San Felipe.	Pringle ..	4668	1894	253033
Fig. 1. *Polianthes tuberosa*	In cultivation	Rose	4114	1898	399945
2. *Polianthes palustris*	Foothills of Tepic ..	....do ...	1943	1897	300835
3. *Polianthes durangensis* ..	Sierra Madre of Durango.	....do ...	3515	1897	302492
4. *Polianthes geminiflora* ..	In cultivation	....do ...	3761	1898	399944
5. *Acacia ambigua*	Matamoras	Rose	4698	1899	366681
8. *Acacia unijuga*	Tampico	Pringle ..	6989	......	396667
11. *Aspicarpa lanata*	Guadalajara	....do ...	4422	1893	301158

The types of all the new species described in the following pages are in the National Herbarium unless otherwise stated. Where more than two collections or specimens are cited, the type is indicated usually by the word type following the number cited.

The drawings from which these illustrations have been made are the work of Mr. Frederick A. Walpole and Miss Anna Snyder.

COMMELINACEAE.

NEOTRELEASEA.

Since the publication of my genus Treleasea, it has come to light[a] that the name then given is a homonym of Treleasia Spegazzand.[b] A change being thus necessitated and Treleasiella having also been published in the same work, I have adopted Neotreleasea as differing sufficiently from these names and still carrying out my wish to honor Dr. William Trelease. It seemed desirable to republish with some slight changes the descriptions and synonymy along with the new names.

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[a] I am under obligations to Mr. Ernst A. Bessey, of the United States Department of Agriculture, for calling my attention to this fact.

[b] Revista de la Facultad de Agronomia y Veterinaria La Plata **2**: 235. 1896.

Neotreleasea Rose, nom. nov.

TRELEASEA Rose, Contr. Nat. Herb. **5**: 207. 1899, not Treleasia Spegaz. Revist. Agron. y Vet. La Plata **2**: 235. 1896.

Type species, *Neotreleasea brevifolia* Rose.

Sepals distinct, concave, subequal, greenish or scarious. Petals distinct, tapering at base into a slender claw, cohering and forming a slender tube. Stamens 6, all perfect, subequal, more or less hairy, borne on the petals. Style slender, 3-lobed. Capsule stipitate, 3-celled. Cells dehiscent, 2-seeded. Perennial herbs from tuberous roots. Cymes sessile, many-flowered, in either terminal or axillary clusters.

This genus differs from Tradescantia, especially in the corolla and the position of the stamens. Tradescantia has always an open flower spreading from the base, with petals broad at base, while Neotreleasea has the petals tapering into a claw, forming a tube and only spreading toward the top. The stamens, too, are always free in Tradescantia, while in Neotreleasea they are borne on the petals.

The genus seems nearer Cyanotis than Tradescantia, but differs from that in its stipitate fruit, concave sepals, etc. It is perhaps nearest Zebrina, differing chiefly in the fact that the petals are not united into a tube, but merely cohere at the edges.

I have long been dissatisfied with the reference of the species *brevifolia* to Tradescantia, having had the plant under cultivation since 1895. While in Mexico in 1897 I found another plant of similar habit with the same flower structure, showing that this is a good generic type. *T. leiandra*, although the flower structure is doubtful, possesses the stipitate fruit and otherwise suggests that it belongs here also.

The genus, as I now understand it, consists of the following species:

Neotreleasea brevifolia (Torr.) Rose. PLATE II.

Tradescantia (?) *brevifolia* Rose, Contr. Nat. Herb. **3**: 323. *pl. 16*. 1895.

Tradescantia leiandra brevifolia Torr. Bot. Mex. Bound. 225. 1859.

Tradescantia speciosa Buckley, Proc. Acad. Phila. **1862**: 9. 1863, not L. nor H. B. K.

Zebrina (?) *leiandra* Clark, in DC. Monogr. Phan. **3**: 318. 1881.

Tradescantia leiandra Wats. Proc. Am. Acad. **18**: 167. 1883, not Torr.

Tradescantia leiandra ovata Coulter, Contr. Nat. Herb. **1**: 50. 1890.

Treleasea brevifolia Rose, Contr. Nat. Herb. **5**: 207. 1899.

Stems prostrate, leafy to the top; leaves approximate, ovate, 2.5 to 7.5 cm. long, 2.5 cm. wide, thickish, glaucous, glabrous except the ciliate-scabrous margins, acute; margin of sheath ciliate; involucral leaves 2, like the lower leaves, but smaller; umbel sessile, many-flowered; corolla white, petals ovate, obtuse, somewhat spreading, tapering at base into a slender claw, stamens erect, longer than the petals, hairy near the middle, attached to the petals; ovary hairy near the top.

For a number of years this species was cultivated in Washington, both in the greenhouses and in the gardens. In the greenhouses it grew luxuriantly under the benches. The foliage is of a glossy bright green, and in all cases the flowers have been white, usually appearing singly.[a]

EXPLANATION OF PLATE II.—Fig. *a*, plant; *b*, margin of leaf; *c*, two views of sepals; *d*, petals; *e*, stamens and base of petal; *f*, back of anther; *g*, style. Fig. *a*, natural size; *b*, scale of 10; *c* and *d*, scale of 2; *e*, *f*, and *g*, scale of 4.

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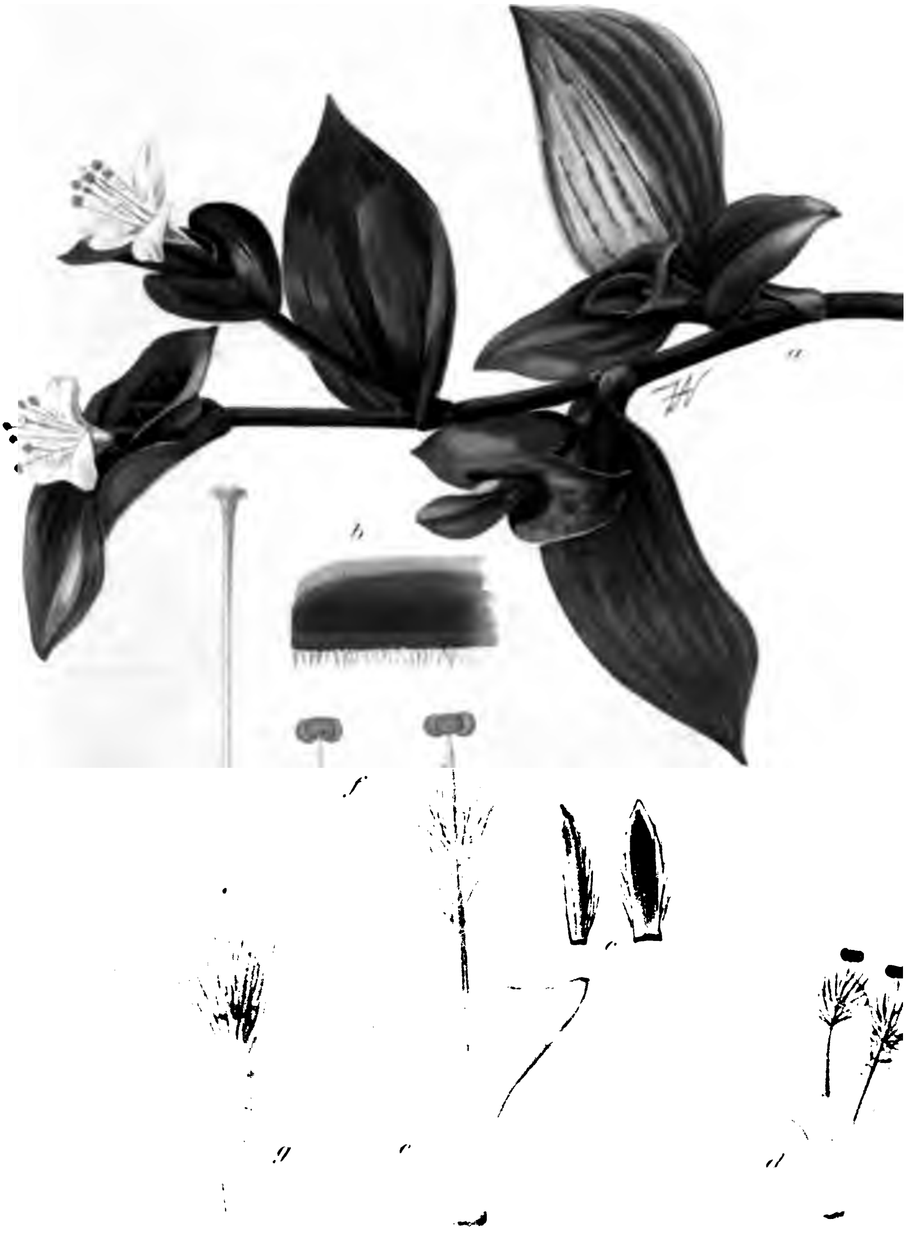
[a] For a full discussion of this species and its relationships with *T. leiandra* see Rose in the third volume of this publication, pages 322, 323.



NEOTRELEASEA BREVIFOLIA (TORR.) ROSE

Neotreleasea leiandra (Torr.) Rose.

Tradescantia leiandra Torr. Bot. Mex. Bound. 224. 1859.

Treleasea leiandra Rose, Contr. Nat. Herb. **5**: 208. 1899.

Roots slender, fibrous-thickened; stems erect, somewhat branching, slender, glabrous, somewhat naked above; leaves distinct, narrowly lanceolate, 7.5 to 12.5 (perhaps more) cm. long, 12 mm. wide, sharply acute, with margins not scabrous; margin of sheath glabrous or nearly so; involucral leaves 2, ovate, acuminate, 2.5 to 3.5 cm. long, very unlike the lower leaves; umbel sessile, many-flowered; pedicels and sepals densely villose; filaments smooth; capsule oval, somewhat 3-lobed, stipitate; cells 3, 2-seeded; seeds 1 mm. in diameter, slightly rugose.

Collected by Bigelow on mountains and in moist rocky places at Puerto de Paysano, Tex., September 18, 1854 (?) (no. 1500), and by V. Havard at Capote Creek, Texas, September, 1883 (no. 79).

Neotreleasea tumida (Lindley) Rose.

Tradescantia tumida Lindley, Bot. Reg. **26**: *pl. 42*. 1840.

Tradescantia virginiana tumida Clark, in DC. Monogr. Phan. **3**: 291. 1881.

Treleasea tumida Rose, Contr. Nat. Herb. **5**: 208. 1899.

The figure cited above, although very unsatisfactory, seems to represent the same species as I collected on the western border of the Mexican table-lands. It has the same reddish flowers borne in dense axillary clusters, and the petals taper down into claws (here represented as united). The leaves are also described as purple beneath. This illustration of Lindley's was made from a plant which flowered in the garden of the Horticultural Society in 1839.

Nothing more of the history of the plant is given than that it came from Mexico. It is not unlikely that this plant was sent in by Hartweg from the same region from which mine came. In 1836 and 1838 he visited Bolaños and the neighboring region and was sending many plants home to the Horticultural Society, by which he had been sent to Mexico. I should state, however, that I have looked through Hartweg's lists of plants, which he said were growing in the gardens, without finding any mention of a Tradescantia.

The following redescription of this species is based upon my own specimens, both herbarium and living:

Stem from tuberous-thickened roots, rather low, very succulent, the clumps often very compact; leaves oblong, 12 to 18 cm. long, acute, more or less pubescent; flowers borne in dense axillary and terminal clusters; pedicels about 10 mm. long, glabrous; sepals glabrous or nearly so, oblong, 8 mm. long; petals pink; stamens slightly hairy; capsule stipitate, reflexed; hairy at tip.

This species seems to be common in damp, sheltered places in the western table-land regions of Mexico, especially in canyons and along cliffs. It was first brought in by Mr. Goldman, and afterwards collected by myself.

Collected by J. N. Rose at San Juan Capistrano, Zacatecas, August 23, 1897 (no. 2486); near Monte Escobedo, Zacatecas, August 27 (no. 2660), and at Bolaños, September 10 to 19 (no. 2890).

Specimens were formerly grown in the Botanical Garden at Washington. This species is so common in the table-land region of Mexico that it seems strange that it is not in the recent collections from Mexico.

Clark's reference of this species as a variety of *Tradescantia virginiana* and statement that it can hardly be distinguished from var. *flexuosa* (*T. pilosa*) can not be entertained.

UNCERTAIN SPECIES.

Treleasea pumila Greene, Pittonia **4**: 225. 1900.

Zebrina pumila Greene, op. cit. **1**: 157. 1888.

While this paper was in proof the type specimens of *Zebrina pumila*, which have long been lost, came to light, and through the kindness of Dr. E. L. Greene I have been permitted to see them. They show clearly that *Z. pumila* is not congeneric with the type species of Neotreleasea, but that its relationships are more nearly with true Zebrina. The two have in common a terminal cluster of flowers subtended by a two-leaved spathe, a narrow tubular corolla, and widely separated anther cells, etc.

AMARYLLIDACEAE.

REVISION OF POLIANTHES WITH NEW SPECIES.[a]

Polianthes tuberosa has been cultivated for more than four hundred years, but its real home is unknown. It has been assigned both to Asia and America. Its allies are all Mexican, although it does not seem to have had its origin in any of the wild species known to the writer, unless it be *P. gracilis*. It has been reported from the higher Andes of South America, and if really not Mexican is probably of South American origin.

Bravoa geminiflora is quite unlike *P. tuberosa* in its short, red, cylindrical perianth tube, and were these species the only ones to be considered, Bravoa might well be kept distinct from Polianthes. With the material on hand I can not find any character or group of characters which will justify doing this. The best character which I find to base a separation of these supposed genera upon is the elongation and bending of the tube, but this would throw *P. tuberosa* and *P. geminiflora* into the same group. While I have been very reluctant to combine these two genera, whose distinctness so far as I am aware has never yet been questioned, I think that their separation hitherto has been partly due to lack of knowledge of the so-called species of Bravoa. Even Dr. J. G. Baker, whose excellent handbook is indispensable to every student of this group, has not clearly distinguished Bravoa.

He describes 4 species which now belong to 3 genera, but which, if Bravoa is retained, must be distributed among as many genera as species. As I understand the genus Polianthes it is composed of 11 or 12 species.

KEY TO SPECIES.

- *Perianth tube elongated (3 to 6 cm. long), bent near the middle.*
  - *Mouth of tube regular; lobes nearly equal.*
    - *Leaves broad, 10 to 15 mm. long; perianth 5 cm. or more broad*......1. ***P. palustris.***
    - *Leaves narrow, 3 to 5 mm. broad; perianth tube 3 to 4.5 cm. long.*
      - *Bracts broadly ovate, acute or shortly acuminate; stigmas included.*
        - *Flowers longer than the next, becoming purplish*..............2. ***P. durangensis.***
        - *Flowers larger than the last, white*..............................3. ***P. sessiliflora.***
      - *Bracts narrowly ovate, long-acuminate; stigmas exserted*............4. ***P. nelsoni.***
  - *Mouth of tube irregular; lobes unequal.*
    - *Perianth 6 to 10 cm. long; anthers sessile*..........................5. ***P. longiflora.***
    - *Perianth 5 cm. or less long; anthers not sessile*......................6. ***P. pringlei.***

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[a] **Polianthes** L. Sp. Pl. **1**: 316. 1753.

BRAVOA Lex. in Llave. & Lex. Nov. Veg. Desc. **1**: 6. 1824.

Type of Polianthes, *P. tuberosa* L. loc. cit.; of Bravoa, *B. geminiflora* Lex. loc. cit.

Perianth tube usually shorter than in the last, bent near the base.
  Perianth lobes somewhat elongated and spreading.
    Stout; leaves broad .... 7. *P. tuberosa.*
    More slender; leaves narrower .... 8. *P. gracilis.*
  Perianth lobes short and erect or slightly spreading.
    Flowers white .... 9. *P. montana.*
    Flowers red or orange.
      Stamens inserted near the top of the tube .... 10. *P. platyphylla.*
      Stamens inserted near the base of the tube.
        Plant pubescent below; leaves grass-like .... 11. *P. graminifolia.*
        Plant glaucous; leaves broad .... 12. *P. geminiflora.*

1. **Polianthes palustris** Rose, sp. nov. FIGURE 1.

Bulbs oval to oblong, 2 to 3 cm. long; stems about 4 dm. high, erect, glabrous throughout; basal leaves several, 2 to 3 dm. long, 12 to 15 mm. broad, narrowed to a more or less distinct petiole, parallel veins prominent, glabrous; stem leaves 3 or 4, becoming much reduced above; flowers 3 to 5 pairs, the lower shortly pediceled, the upper nearly sessile; perianth 3 to 6 cm. long, curved just below the middle, white; segments short (5 to 6 mm. long), broad, rounded at apex, somewhat spreading; filaments short, inserted near the top of the tube; anthers not exserted; ovary free at tip.

Collected by J. N. Rose in swamps on the western foothills of the Sierra Madre, between Acaponeta and Pedro Paulo, Territorio de Tepic, August 2, 1897 (no. 1943).

The flowering specimens of this plant gave off the delightful odor of the common cultivated tuberose.

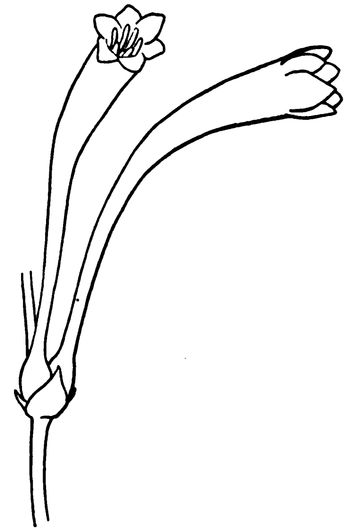

FIG. 1.—Flowers of *Polianthes palustris*, natural size.

2. **Polianthes durangensis** Rose, sp. nov. FIGURE 2.

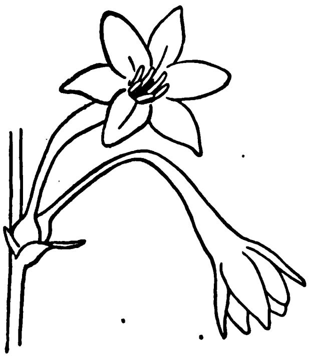

FIG. 2.—Flowers of *Polianthes durangensis*, natural size.

Bulbs small, 2 cm. long; stems 3 to 6 dm. high, erect, glabrous throughout; basal leaves several, 1 to 2.5 dm. long, erect, linear, 3 to 5 mm. broad, with prominent parallel veins, glabrous; stem leaves about 3, the upper much reduced; flowers 1 to 6 pairs, all sessile; perianth 4 to 5 cm. long, at first nearly erect, becoming curved (in age strongly so) near the middle, nearly white but drying purplish; segments spreading, 8 mm. long, rounded at apex; stamens inserted near the top of the perianth tube; filaments short; anthers not exserted; ovary free at tip.

Collected by J. N. Rose on the west slope of the east range of the Sierra Madre in the State of Durango, August 16, 1897 (no. 3515, type); also (probably this) near Santa Teresa, Territorio de Tepic, August 11, 1897.

3. **Polianthes sessiliflora** (Hemsl.) Rose.

Bravoa sessiliflora Hemsl. Diag. Pl. Nov. **3** : 54. 1880.

We have a duplicate type of this species in the National Herbarium. It is only known from the type collection made by Parry & Palmer in 1878.

4. **Polianthes nelsoni** Rose, sp. nov.

Bulbs oblong; bulb coats thin, sparingly nodose; stems about 4 dm. high, erect, glabrous; basal leaves several, linear, serrulate on the margins; stem leaves much reduced; flowers (in specimens seen) 2 to 5 pairs, sessile; bract subtending each pair of flowers narrowly ovate, long-acuminate; perianth tube about 5 cm. long, strongly curved downward near the middle, very slender below, white; lobes short and rounded at apex; filament 3 mm. long, about one-half as long as the anthers, attached near the top of the tube; stigmas exserted.

Specimens examined:

Durango: Near Durango City, E. W. Nelson, August 1, 1898 (no. 4630, type); on road between Guadalupe y Calvo and Paral, E. W. Nelson, September 11, 1898 (no. 4972).

5. **Polianthes longiflora** Rose, sp. nov.

A tall plant, glabrous; flowers in 3 to 5 distant pairs; perianth 6 to 10 cm. long, rather slender below, white or tinged with purple, curved above the middle, the mouth somewhat irregular; segments broad, oblong, 2 cm. long, obtuse; anthers slender, 10 to 12 mm. long, sessile.

This species was found in great abundance during the later part of August, 1901, in the market at Guadalajara (Rose, no. 6290). It is brought in by the Indians from a great distance, and sold as "nardo," the Spanish name for the common tuberose.

6. **Polianthes pringlei** Rose, sp. nov.

Bulbs small, 2 cm. long; stems 2 to 3 dm. high, erect, glabrous throughout; basal leaves about 6, linear, erect, 1 to 3 mm. wide; stem leaves 3, the upper ones much reduced; flowers (in specimens seen) 3 to 4 pairs, all sessile; perianth 4.5 to 6 cm. long, becoming curved near the middle, white, sometimes drying purplish; segments linear, the lower one more deeply cut, 10 to 15 mm. long, rounded at apex; filaments short, inserted near the top of the tube.

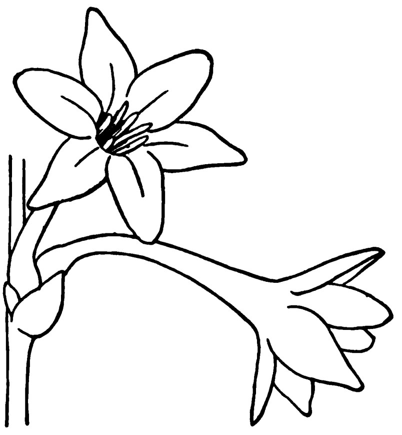

FIG. 3.—Flowers of *Polianthes tuberosa*, natural size.

Collected by Mr. C. G. Pringle on moist hills near Guadalajara, August 23, 1893 (no. 5438, type), and obtained in the market place of Guadalajara, August 24, 1901 (no. 6291).

This is one of the species brought in by the Indians for sale under the name of "nardo." The flowers are very fragrant. The species ought to be introduced into cultivation.

7. **Polianthes tuberosa** L. Sp. Pl. 1: 316. 1753. FIGURE 3.

Stems in clusters, 10 dm. high; basal leaves several, 3 to 5 dm. long, 6 to 15 mm. broad, bright green, reddish near the base; inflorescence a lax spike; corolla pure waxy white; tube 3 cm. long, bent only near the base; lobes oblong, 15 mm. long, obtuse; filaments inserted on the upper part of the corolla; tube shorter than lower part of the anthers.

Description drawn from cultivated specimens.

8. **Polianthes gracilis** Link & Otto, Enum. Pl. Hort. Berl. 1: 331. 1821.

P. tuberosa gracilis Baker, Handbook Amaryl. 159. 1888.

Link & Otto, as well as Kunth, say that this species is from Brazil, but Baker and others refer it to Mexico. The original illustration suggests a species very near the true *P. tuberosa.*

I have not seen this species. It is said to have flowered at Kew in 1880.

While I question very much the wisdom of retaining *gracilis* as a good species, I have refrained from merging it with *tuberosa* simply because I know scarcely anything of it. Mr. Baker is probably right in thinking it not a distinct species, but I should be inclined to go a step farther and treat *P. gracilis* as the form from which *P. tuberosa* has sprung.

9. **Polianthes montana** Rose, sp. nov.

Bulbs oblong; stems slender, 12 dm. high, erect, glabrous and more or less glaucous; basal leaves several, 2 to 3 dm. long, 5 to 8 mm. broad; stem leaves about 6, distant, much reduced above; flowers about 12 pairs (in my single specimen), all more or less pediceled; perianth 16 to 20 mm. long, slightly curved near the base, white; lobes small, erect, rounded at apex; stamens inserted much below the middle; filaments longer than the anthers, the latter included; ovary free at tip.

Collected by J. N. Rose in a deep canyon near Santa Teresa, in the Sierra Madre, August 11, 1897 (no. 2178).

10. **Polianthes platyphylla** Rose, sp. nov.

Rootstock short and thick, giving off a number of thickened roots; rootstock crowned by an oblong bulb about 2.5 cm. in diameter; basal leaves 3 or more, lying flat upon the ground, oblong, 7.5 to 12.5 cm. long, 12 to 30 mm. broad, tapering at base into a short petiole, acute, glabrous; stem leaves 2 to 4, small and bract-like; peduncle 3 to 4 cm. long; inflorescence a very open spike; bracts ovate, acute; flowers in 4 to 7 pairs, whitish or red; perianth tube about 16 mm. long, at first erect, but becoming curved or bent near the base; lobes rounded, 2 mm. long, spreading; stamens shorter than the anthers, inserted near the top of the perianth tube, included; style tips exserted; fruit nearly orbicular, or somewhat 3-lobed, about 10 mm. in diameter.

Rather common on the northern border of Jalisco, along with *P. graminifolia*, but much less frequent, and also on the slopes of the Sierra Madre, in the State of Durango.

Specimens examined:

Durango: In Sierra Madre, J. N. Rose, August 16, 1897 (no. 2324).

Jalisco and Zacatecas: On the table-lands, both sides of boundary, J. N. Rose, August 26, 1897 (no. 2598, type).

The few specimens seen in Durango had white flowers, but in other respects did not seem to differ from the table-land specimens.

Bulbs were brought home to Washington in 1897 which flowered in the Botanical Garden in 1899. These specimens had the flowers nearly white, tinged with red.

11. **Polianthes graminifolia** Rose, sp. nov.

Bulbs oblong, the coats thin, sparingly nodose; stem slender, 2 to 3 dm. long, densely puberulent below, glabrous above; basal leaves elongated, grass-like, 3 to 6 dm. long, densely puberulent beneath, glabrous above; flowers in 8 to 15 pairs, the lower ones often on peduncles 1 cm. long; pedicels 3 to 10 mm. long; flowers about 2.5 cm. long, bent downward near the base, dark red in color; filaments slender, attached low down in the tube.

Near *P. geminiflora*, but with the leaves and lower part of the stem covered with a short, stiff pubescence, with deeper red flowers, etc.

The plant is very common in meadows on the Mexican table-land along the boundary line between the States of Jalisco and Zacatecas. It was first observed by the writer south of Huajuquilla, and later in suitable localities southward nearly to Guadalajara.

Specimens examined:

Jalisco: On the road between Huajuquilla and Mesquitec, J. N. Rose, August 25, 1897 (no. 2571, type); bulbs from near Monte Escabedo, August, 1897, and between Bolaños and Guadalajara, September 21, 1897 (no. 3088); also about Guadalajara, Dr. Edward Palmer, 1896 (nos. 345 and 346); same locality, C. G. Pringle, 1889.

A goodly quantity of bulbs was sent to Washington, but they have not been properly cared for.

12. **Polianthes geminiflora** (Lex.) Rose. FIGURE 4.

Bravoa geminiflora Lex. in Llave & Lex. Nov. Veg. Desc. **1**: 6. 1824.

Bravoa coetocapnia Roem. Syn. Monogr. **4**: 245. 1847.

Coetocapnia geminiflora Link & Otto, Ic. Pl. Rar. Hort. Berol. 35. 1828.

Zetocapnia geminiflora Link & Otto, loc. cit. *pl. 18*. 1828.

Bravoa graminiflora Hemsl. Biol. Centr. Am. **3**: 338. 1884. (The species name evidently an error.)

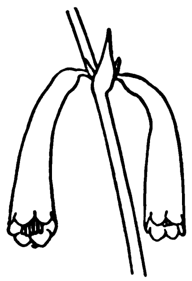

FIG. 4.—Flowers of *Polianthes geminiflora*, natural size.

Bulbs rather shallow, giving off several thickened roots; stem 4 to 7 dm. tall, perfectly glabrous throughout; basal leaves several, 3 to 5 dm. long, 10 to 13 mm. broad; stem leaves 3 or 4, becoming successively shorter; racemes 2 to 4 dm. long; flowers in a few (6 or more) distant pairs; pedicels slender, 6 to 10 mm. long; perianth rather pale red or orange-colored, about 2 cm. long, strongly bent downward near the base; lobes short and broad, rounded at tip and slightly puberulent just below the tip.

Specimens examined:

England: Cultivated specimens taken from garden in London.

State of Mexico: Meadow swells, valley of Toluca, C. G. Pringle, August 19, 1892 (no. 4215), and also from low meadows at Flor Maria, July 28, 1890 (no. 3633); near Tultenango, J. N. Rose, July 13, 1901 (no. 5420).

Type locality: "In montibus Micciacanis, et prope Vallisoletum," or, as Hooker translates,[a] "Mountains of Valladolid and Miciciacan." Valladolid (now Morelia) is a town in the State of Michoacan. Although discovered more than seventy-five years ago, and in cultivation since 1838, it has very rarely been collected. It is native of the high mountain valleys of cenral Mexico, the type coming from the eastern part of the State of Michoacan. The material collected by the writer in 1901, though from the State of Mexico, was from its extreme northern part and very near the eastern line of Michoacan. It agrees also closely with the cultivated material which may have been derived from the early supplies of this species. This being true, the way is cleared for separating (as *graminifolia*) the material from the State of Jalisco which has been distributed as *Bravoa geminiflora*.

My cultivated material was kindly sent me by Mr. E. G. Baker of the British Museum. The bulbs have flowered and I have had a good colored drawing made.

Illustrations:

Herbert, Amaryl. *pl. 12, figs. 5 and 6.*

Bot. Mag. **79**: *pl. 4741.*

Fl. Ser. **5**: *pl. 520.*

Link & Otto, Ic. Pl. Rar. Berol. *pl. 18*, under Coetocapnia (not seen).

Hooker has figured in Botanical Magazine[a] as *Bravoa geminiflora* a plant which seems to differ from my material as follows: The basal leaves are more numerous and of a dark bluish green color, the flowers longer and broader, of a much deeper red color, with a more gradually curved perianth tube, and a longer-exserted style. If these characters, drawn from Hooker's illustration, should be confirmed by the specimen, I should have little hesitation in separating it specifically from *geminiflora*. But until the original material has been examined, or more collected at Real del Monte, the source of Hooker's specimens, no further note need be taken of it.

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[a] Vol. 79, plate 4741.

SPECIES EXCLUDED.

P. maculata Mart. = *Manfreda* sp.
P. mexicana Link. = *Prochnyanthes* sp.

SPECIES OF BRAVOA EXCLUDED FROM POLIANTHES.

B. singuliflora Watson = *Manfreda* sp.
B. densiflora Robinson & Seaton = *Pseudobravoa densiflora* Rose.
Bravoa bulliana Baker = *Prochnyanthes bulliana* Baker.

PROCHNYANTHES AND ITS SPECIES.[a]

The genus Prochnyanthes seems to be well marked, but close to Polianthes, distinguished chiefly by its perianth. The writer is undecided whether there is but one or several species. From his observations on material referred to one of the so-called species, he is inclined to the opinion that there is only one somewhat variable species. Three, however, have been described, and under as many generic names. The first was described in 1837 as *Polianthes mexicana*, and afterwards referred to *Polianthes tuberosa*. If there is but a single species, the name *Prochnyanthes mexicana* must stand. The second was described as *Bravoa bulliana*, but has been more recently referred to Prochnyanthes. The third was described as the type of Prochnyanthes.

This genus was established by Dr. Sereno Watson in 1887 upon plants brought back by Dr. Edward Palmer from near Guadalajara. It has been supposed to be known only from this region. The writer found the type species to be very common in the Sierra Madre, and specimens were brought back from the Territorio de Tepic and the States of Durango, Zacatecas, and Jalisco, of western Mexico. These specimens show considerable variation from the type, but I have been compelled to consider them forms of a widely varying species.

Living specimens were brought home, and these are the first which have been reported in cultivation. The underground portion of the plant has been wrongly characterized, and as my specimens show some deviations from the type, I have thought best to recharacterize the species, drawing largely from notes taken in Mexico with the living plant in hand.

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[a] Prochnyanthes Wats. Proc. Am. Acad. 23: 457. 1887.
Type species, *P. viridescens* Wats. loc. cit.

Prochnyanthes viridescens Watson, loc. cit. FIGURE 5.

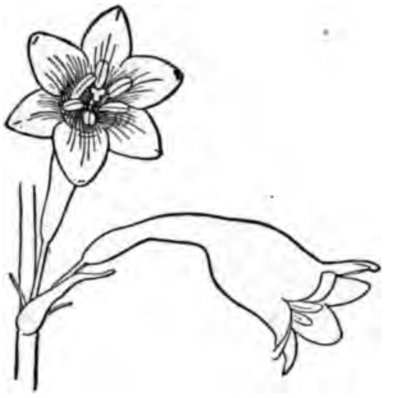

FIG. 5.—Flowers of *Prochnyanthes viridescens*, natural size.

Rootstock thick, sending off many thickened roots, crowned with a bulb 5 cm. or more long, this clothed with the fibrous remains of old leaves; stem erect, 18 dm. high; leaves few, becoming bracteate above, glabrous and somewhat glaucous; basal leaves numerous, 3 to 5 dm. long, 4 to 5 cm. broad, mostly erect; inflorescence a lax raceme of 5 to 30 pairs of flowers; pedicels 4 cm. long to nearly wanting; perianth from greenish to brown; the lower part of the tube cylindrical, ascending, and just below the middle abruptly swollen and bent, the upper part somewhat pendant and bell-shaped; lobes broadly ovate, 6 to 8 mm. long; stamens inserted below the bend in the perianth; filaments slender; capsule orbicular, 10 to 15 mm. in diameter.

Specimens examined:

Jalisco: Cool grassy slopes of rocky hills near Guadalajara, C. G. Pringle, August 18, 1893 (no. 4505); Rio Blanco, Dr. Edward Palmer, June to October, 1886 (no. 9, type); near Colotlan, J. N. Rose, August 28, 1897 (no. 2679); on road between Bolaños and Guadalajara, J. N. Rose, September 22, 1897 (no. 3098); Sierra Madre, west of Bolaños, J. N. Rose, September 17, 1897 (no. 3724).

Zacatecas: Near Monte Escobedo, J. N. Rose, August 26, 1897 (no. 2628).

Durango: Vicinity of city of Durango, Dr. Edward Palmer, April to November, 1896 (no. 558a); J. N. Rose, August to September, 1897 (no. 3750).

Territorio de Tepic: Between Dolores and Santa Gertrudis, J. N. Rose, August 7 and 10, 1897 (no. 2045).

Prochnyanthes bulliana Baker, Bot. Mag. **121**: *pl. 7427*. 1895.

Bravoa bulliana Baker, Gard. Chron. **22**: 328. 1884.

P. bulliana hardly differs from *P. viridescens*, but it is described as having large flowers, which are sessile instead of having long pedicels.

Another distinction pointed out by Baker seems not to hold. He states in the Botanical Magazine that *P. viridescens* has long pedicels, articulated near the middle. It seems true that the pedicels are usually long, though they are sometimes nearly wanting; but they are always jointed just at the base of the flower. While *P. bulliana* is figured and described with sessile flowers, yet it was originally described as having the flowers shortly pediceled.

Prochnyanthes mexicana (Zucc.) Rose.

Polianthes mexicana Zucc. Abhandl. Akad. Muench. **2**: 319. 1837.

I have not seen specimens of this plant. It certainly is not an Agave, as suggested by Kunth, nor is it *Polianthes tuberosa*, to which species it is referred by the Kew Index. From the description I can not separate it from *Bravoa bulliana* Baker, possessing as it does flowers of the same size, form of perianth tube, color, and insertion of stamens. It should, therefore, be taken up as *Prochnyanthes mexicana*.

MANFREDA AND ITS SPECIES.[a]

In a former paper in the Contributions from the U. S. National Herbarium[b] I called attention to the desirability of restoring Manfreda to generic rank, or, perhaps better, of separating the herbaceous-leaved Agaves and using for them Salisbury's name, Manfreda, which he had applied only to *Agave virginica*.

Since that paper was prepared for publication I have twice visited Mexico, where I gave especial attention to the Agaves and their allies. I am now more strongly convinced than ever that Manfreda is generically distinct from Agave proper. It differs from Agave in its habit, in its manner of growth, in its foliage, in its inflorescence, etc.

In Manfreda true bulbs are formed, from which annually appear stems that flower and die down to the ground. The leaves are comparatively thin and are neither spiny-edged nor spiny-pointed. The inflorescence is a simple lax raceme or spike and the flowers are borne singly.

In Agave proper no bulbs are formed and the plants persist for years, some species flowering frequently, but many only once; the leaves are mostly fleshy, rigid, usually spiny-pointed, and generally horny or spiny-edged. The inflorescence is an open panicle or a dense spike, with the flowers in pairs.

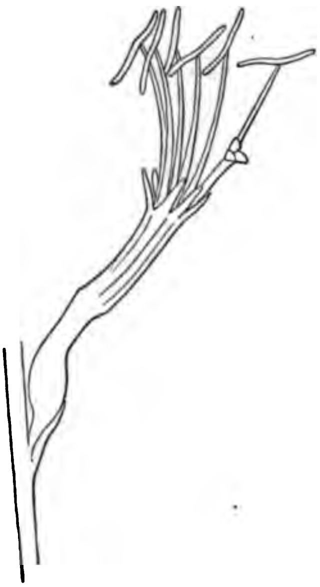

FIG. 6.—Flower of *Manfreda virginica*.

Both Agave and Manfreda reach their greatest development in Central Mexico, and both have considerable economic importance. The Agave species called maguey, as is well known, furnish pulque, mescal (now generally called tequila), and fiber, and have numerous other uses. The Manfredas called "amole" are one of the commonest soap plants of the country. The root is always to be found in great quantities in every Mexican market.

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[a] **Manfreda** Salisb. Gen. Pl. Frag. 78. 1866.
DELPINOA Ross, Boll. Orto Bot. Palermo **1**: 117. 1887.
LEICHTLINIA Ross, Del. Sem. Hort. Bot. Panorm. 48. 1893.
ALLIBERTIA Marion, Rev. Hort. Bouch. Rhone. 1882.
Type species:
Of Manfreda, *Agave virginica* L.
Of Delpinoa, *D. gracillima* Ross.
Of Leichtlinia, *Agave protuberans* Engelm.
Of Allibertia, *A. intermedia* Marion.
The further bibliography (Ross) of Leichtlinia is as follows:
Boll. Soc. Sci. Nat. Palermo [reprint, p. 2].
Ic. Descr. Pl. Nov. Rar. *pl. 3.* 1896.
Bot. Central. 74: 217. 1898.

[b] **Vol. 5, p. 155.**

KEY TO SPECIES.

Perianth tube strongly curved .... 1. *M. singuliflora.*
Perianth tube slightly if at all curved.
Filaments about the length of the tube .... 2. *M. maculosa.*
Filaments much longer than the tube.
Filaments of two lengths .... 3. *M. potosina.*
Filaments of equal lengths.
Leaves pubescent .... 4. *M. maculata.*
Leaves not pubescent.
Segments of the perianth much shorter than the tube.
Leaves spotted .... 5. *M. pringlei.*
Leaves not spotted.
Margin of leaf armed with "hooked spines" .... 6. *M. brunnea.*
Margin of leaf entire or nearly so.
Stamens inserted near the base of the perianth tube ...... 7. *M. virginica.*
Stamens inserted near the top of the perianth tube... 8. *M. brachystachys.*
Segments of the perianth equal to or longer than the tube.
Segments about equal to the tube.
Leaves spotted .... 9. *M. variegata.*
Leaves not spotted.
Perianth brownish .... 10. *M. elongata.*
Perianth yellow or greenish.
Flowers in a dense spike .... 11. *M. revoluta.*
Flowers in a lax spike............................. 12. *M. oliverana.*
Segments much longer than the tube.
Leaves spotted .... 13. *M. guttata.*
Leaves not spotted.
Leaves short and broad................................ 14. *M. planifolia.*
Leaves narrow and elongated.
Leaves 3 cm. broad................................ 15. *M. undulata.*
Leaves 1 cm. or less broad.
Stamens 3 to 4 cm. long.......................... 16. *M. rubescens.*
Stamens 6 to 7 cm. long .... 17. *M. jaliscana.*

1. **Manfreda singuliflora** (Wats.) Rose.

Bravoa singuliflora Wats. Proc. Am. Acad. **22**: 479. 1887.

Stems slender, 6 to 9 dm. long, glabrous, somewhat glaucous; basal leaves 8 to 10, 3 dm. long, 4 to 6 mm. wide, acute, with a scarious undulate margin; stem leaves few and much reduced above; inflorescence a very lax raceme of 8 to 12 solitary flowers; pedicels of flowers 2 to 3 mm. long, of fruit sometimes no longer, sometimes becoming 15 mm. long; perianth 3 dm. long (including the ovary), more or less curved downward, somewhat purplish; lobes spreading, oblong, 6 to 8 mm. long, bearing a tuft of hair at apex; filament but shortly exserted; style exserted; carpels globular to oblong, about 15 mm. long.

Type locality: "Mountains near Chihuahua."

Specimens examined:

Chihuahua: On cool hillside near Chihuahua City, C. G. Pringle, August 19, 1897 (no. 1381); in southwest Chihuahua, E. W. Nelson, August 21, 1898 (no. 4814); near Batopilas, E. A. Goldman, October 4 and 5, 1898 (no. 207); near Colonia Garcia, E. H. T. Townsend and E. M. Barber, July 11, 1899 (no. 120).

This species is certainly congeneric with the other species referred to Manfreda, having the same habit and inflorescence, and differing only in its peculiarly curved perianth tube and its short stamens.

In its curved tube it approaches Polianthes, but it has single flowers and exserted stamens. *Agave saponaria* (*M. brachystachys*) is figured and described as having a curved tube, although this is not so strongly bent as in the above species. In its short stamens it is unlike all the Manfredas except *M. maculosa*, which has stamens shorter than the lobes of the perianth.

This species may be considered a good generic type by some.

2. **Manfreda maculosa** (Hook.) Rose.

Agave maculosa, Hook. Bot. Mag. 85: *pl. 5122.* 1859.

Agave maculata, Engelm. Bot. Mex. Bound. 214. 1859, not Regel, 1856.

Basal leaves 6 to 10, blotched with brown or sometimes with green, the margins serrulate; scape 3 to 6 dm. long, with about 6 small bracts, purplish; flowers 10 to 25, nearly sessile, almost 5 cm. long (including ovary); tube narrowly funnel-shaped, a little longer than the purplish or greenish white, somewhat spreading lobes; filaments a little shorter than the perianth lobes; anther cells exserted, brownish; stigmas 3-lobed.

This species has repeatedly flowered in the National Botanic Garden. Specimens prepared by J. N. Rose are in the National Herbarium (nos. 4055, 4076).

Baker in his Handbook of Amaryllideae takes up *A. maculosa* Regel for this plant; but according to Regel's description his species has long-exserted stamens, and it is more than likely to be one of the several spotted-leaved species of central Mexico.

The type of Regel's plant was grown from seed sent by Karwinski from Mexico. Karwinski collected largely if not entirely in south Mexico, especially in the State of Oaxaca. In 1840 to 1843 he collected for the Russian Government, at which time he probably obtained the seed of this plant.

Dr. Engelmann was of the opinion that this plant was not the *maculata* of Regel, and in his revision of the Agaves he employed Hooker's specific name, *maculosa*. Miss Mulford, however, in her revision of the North American Agaves hesitatingly adopts Regel's name, but points out clearly that it possesses characters which show it to be specifically distinct.

As Miss Mulford states, the species is rather variable and I am not inclined to recognize as a variety *Agave maculosa brevituba* Engelm. (*A. maculata brevituba* Mulford).

This species is confined entirely to Texas.

The following paragraph was drawn up from a Texas specimen which flowered in Washington several years ago:

A form having the leaves spotted with green was sent in along with the purple spotted leaved form; corolla tube shorter than the lobes and the lobes very spreading; filaments apparently longer than in other forms, but scarcely longer than the segments; segments at first greenish yellow but in age becoming a dark pink; stamens rounded, not emarginate. This appears to be the *A. maculosa brevituba* of Engelmann. Here also seems to belong *A. maculosa* as figured by Hooker in Curtis's Botanical Magazine, vol. 85, *pl. 5122*, for it has the same spotted leaves, the short perianth tubes tinged with yellow, and the round stigmas.

For a number of years I had growing in one of the greenhouses roots of the so-called *Agave maculata* from Texas. In the summer of 1898 I transplanted this pot to my yard and in June it flowered, having sent up two flowering stalks. These had peduncles 6 dm. long, more or less purplish and glaucous, bearing 9 and 10 leaves or leaf-like bracts, and each had about 25 flowers. The flowers when they first opened had nearly white filaments, style, and segments, the latter being somewhat purplish without, but in age all became dark reddish rose, the segments becoming strongly reflexed.

3. **Manfreda potosina** (Robinson & Greenman) Rose.

Agave potosina Robinson & Greenman, Proc. Am. Acad. **29**: 393. 1894.

Delpinoa gracillima Ross, Boll. Orto Bot. Palermo **1**: 117. 1897.

Stems slender, 3 to 6 dm. high; basal leaves 4 to 6, 1 to 1.5 cm. long, 10 mm. broad, acute, the margin with short linear teeth, sometimes irregularly tipped, rather conspicuous for the genus; flowers 10 to 15, solitary (rarely in pairs) in the axils of bracts, short-pediceled; perianth tube 6 mm. long, very narrow; lobes 9-nerved, equal to the tube; stamens long-exserted, of two lengths; capsule glaucous, 10 to 12 mm. in diameter.

Type locality: "Los Charcos," San Luis Potosi, Mexico.

Only known from Mr. Pringle's specimens (no. 3745).

Delpinoa gracillima is undoubtedly the same as *Agave potosina* and is probably from the same collection, namely, from specimens gathered by Mr. Pringle in 1891 in the State of San Luis Potosi.

I have seen specimens of the latter and it possesses all the characters except the paired flowers. Ross describes (and a photograph of his in the Gray Herbarium also shows it) the upper flowers as solitary while the lower ones are paired, one being sessile while the other is slender-pediceled! This of course is a very remarkable character, but the same is occasionally met with among the allied species. Engelmann cites a case in which a plant of *A. virginica* year after year produced a second flower (sometimes a third one) from the bract; peculiar variations in the inflorescence have been noted in *Polianthes tuberosa* and *P. geminiflora.* This leads me to believe that the inflorescence is abnormal. All of Mr. Pringle's herbarium plants have single flowers on short pedicels. *Agave potosina* also has (in agreement with the description of Delpinoa) the stamens in two lengths, the tube slightly constricted at base, the style wholly included, and the segments short. Ross states in substance that Delpinoa differs from all known Agaveae in having three long and three short stamens and in having the flowers in the lower part of the inflorescence paired, while above they are solitary. The very unequal stamens in this species seem to be unusual, although they are found in some other species, but in other respects it comes very close to *M. virginica.*

A photograph in the herbarium of the Missouri Botanical Garden of a specimen which flowered there has the spike with single flowers in the axils of each bract, except in one case.

4. **Manfreda maculata** (Mart.) Rose.

Polianthes maculata Mart. Amoen. Bot. Mon. 19. *pl. 13.* 1831 (?), not *Agave maculata* Regel (1856) nor Engelmann (1859).

Agave pubescens Regel & Ortgies, Gartenfl. **23**: 227. *pl. 804.* 1874.

Basal leaves (in herbarium specimens) 4, somewhat lanceolate, narrowed at base, acuminate, 2.5 cm. or more wide at widest point, 3 dm. long, dull green, with large brown spots, pubescent on both sides, paler beneath; stem, including inflorescence, less than a meter high; stem leaves 3 or 4, bractlike; flowers rather few, the lower ones 2.5 cm. apart, sessile or nearly so, subtended by a narrow bract; perianth tubes 12 to 16 mm. long, purplish; perianth lobes somewhat shorter; stamens much exserted; capsule oblong, 2 cm. long, smooth.

The above description is drawn from flowering specimens of Mr. Nelson's and fruiting specimens of the writer's. The two specimens come from widely separated localities, and it is possible they may represent different forms, but as one is in fruit and the other is in flower they can not well be compared. They agree in having broad, tapering, pubescent and spotted leaves, a combination which is found in no other species known to the writer.

Specimens examined:

Chiapas: On ridge near Tonala, E. W. Nelson, August 10, 1894 (no. 2877).

Morelos: In mountain forests above Cuernavaca, J. N. Rose, May 27 to 30, 1899 (no. 4402).

The plant here characterized departs in some particulars from Baker's description of *A. pubescens*, especially in the length and color of the perianth lobes, and may yet prove to be different. This is, however, the only species which is known to have pubescent leaves.

Mr. J. M. Greenman, in a letter dated November 29, 1898, says:

"I believe you are right in considering *Polianthes maculata* and *Agave pubescens* to be one and the same. I have just compared the illustrations and read over the descriptions, and they seem to me to be the same."

5. **Manfreda pringlei** Rose, sp. nov.

Stems slender, 9 to 10 dm. high, glabrous; leaves linear-lanceolate, about 3 dm. long, 15 to 20 mm. broad, green with brown spots; flowers in a short compact raceme or spike, perhaps becoming more open in age; ovary 10 mm. long; perianth tube 8 to 12 mm. long; lobes purplish, 8 mm. long; stamens inserted near the middle of the tube, long-exserted, 5 cm. long; fruit orbicular, 15 mm. in diameter.

Collected by Mr. C. G. Pringle on San Felipe in 1894 (no. 4745), and distributed as *Agave guttata*, from which it differs.

Perhaps nearest *M. brachystachys*, but with smaller flowers and with different insertion of the stamens.

6. **Manfreda brunnea** (Wats.) Rose.

Agave brunnea Wats. Proc. Am. Acad. **26**: 156. 1891.

Leaves few, thickish, 1 dm. long, 12 to 20 mm. broad near the middle; flowering stem 6 dm. long, about 6-flowered; flowers sessile; ovary 12 mm. long; perianth 3 to 3.5 cm. long, the lobes about half as long as the narrow tube; stamens and style long-exserted.

Collected by Mr C. G. Pringle on the battlefield of Buena Vista, Tamaulipas, Mexico, July, 1888 (no. 2218).

7. **Manfreda virginica** (L.) Salisb. Gen. Pl. Frag. 78. 1866.

Agave virginica L. Sp. Pl. **1**: 323. 1753.

Leaves all from the base, about 10, at first erect, then spreading, nearly flat, about 2 dm. long, 3 cm. wide at about two-thirds of the distance from the base, then gradually tapering downward to the narrow base and upward more abruptly into a slender acumination with a weak point, green, but somewhat mealy, not at all spotted; margins slightly serrulate; scape 7 to 8 dm. long, about 7-bracteate, glaucous; spike about 6 dm. long, about 30-flowered; flowers solitary and distant, the lower on pedicels 6 to 8 mm. long, the upper short-pediceled; ovary 14 mm. long, somewhat constricted above; perianth greenish, less than 2.5 cm. long; segements 8 mm. long, erect, margins involute, hairy at tip; stamens shortly exserted; filaments dark purple, inserted near the base of the tube; anthers whitish, spotted with brown; style shorter than the stamens; capsule globose, 14 to 20 mm. in diameter.

The writer has collected this species on the Kentucky River, near Lexington, and flowered it in the National Botanic Garden.

Distribution: Maryland to southern Indiana and Missouri and to eastern Texas and Florida.

I have not been able from the description to separate *Agave aliberti* Baker (*Allibertia intermedia* Marion) from the above. Indeed, it was originally distributed as *Agave virginica* by Haage & Schmidt.

Manfreda virginica tigrina (Engelm.) Rose.

Agave virginiana tigrina Engelm. Trans. St. Louis Acad. **3**: 302. 1875.

A spotted-leaved form first found in Bluffton, South Carolina, and recently reported by Dr. Trelease from Missouri. I have seen the type specimen in the Missouri Botanical Garden.

8. **Manfreda brachystachys** (Cav.) Rose.

Agave brachystachys Cav. Descr. 453. 1802.

Agave polyanthoides Cham. & Schlecht. Linnæa **6**: 55. 1831.

Agave saponaria Lindl. Bot. Reg. **24**.: misc. no. 141. 1838.

Basal leaves several, spreading, green, glabrous, not spotted, somewhat reddish at base; peduncle rather stout, many-flowered, the subtending bract as long as the ovary, acuminate; ovary sessile, 1 to 1.4 cm. long; perianth tube 2 to 2.4 cm. long, more or less curved, especially in age; lobes oblong, 1.4 to 1.6 cm. long; stamens inserted 4 to 6 mm. below the top of the perianth tube, long-exserted, reddish especially below the filaments, ribbon-like in herbarium specimens; capsule oblong, 2 to 2.4 cm. long, abruptly constricted at base (in my specimen). This seems to be a widely distributed species extending from northern Mexico to Guatemala. I would refer here the following collections:

Coahuila: Saltillo, Dr. E. Palmer, 1880 (no. 1307).

Jalisco: Between Huejuquilla and Mesquitec, J. N. Rose, August 25, 1897 (no. 2592); near Guadalajara, J. N. Rose, September 22, 1897 (no. 3097).

Federal District: Pedregal, Valley of Mexico, C. G. Pringle, 1896 (no. 6587).

Chiapas: About Ocuilapa, E. W. Nelson, August 21, 1895 (no. 3057).

Guatemala: Near Santa Rosa, Heyde & Lux, November, 1892 (no. 4292).

Baker and others have regarded the species as really Mexican. I collected specimens on the table-lands of Mexico which answer Lindley's description and figure in every detail. It occurred to me that Hartweg might have collected the plant in this same region, and, on referring to his paper relating to his visit to Mexico, I find that he mentions *Agave saponaria* as seen by him, and that on another page it is listed among the plants sent by him, which either had flowered or were growing in the gardens of the Horticulture Society of London.

Hartweg's plants were collected in 1838 (probably early in the year) and Lindley's description was published in October of the same year.

Lindley says of the habitat of this species in connection with the original description:

"For this new species of Agave I am indebted to James Bateman, esq., who received it from his friend, Mr. Skinner. The latter gentleman, traveling in Peru, found it growing on a sandy plain, and learned that it is used as a soap plant."

Elsewhere he says, "It seems to be Mexican."

Very near the above species must be *Agave sessiliflora* Hems.[a] The description is based upon two specimens of Bourgeau's, one from the Orizaba region (no. 3003) and the other from "Barranca de Pedregal." From the latter place Mr. Pringle has collected specimens (no. 6587) which he has distributed under the above name. In the latter specimens the leaves are sometimes 4.3 cm. wide, the flowers including the ovary and stamens are 7.5 to 8.7 cm. long, while the perianth itself is 3.7 cm. long, the lobes being shorter than the tube. These specimens of Mr. Pringle's seem very near *A. brachystachys.*

The species is figured in the Biologia Centrali-Americana, *pl. 88B.*

9. **Manfreda variegata** (Jacobi) Rose.

Agave variegata Jacobi, Hamb. Gartenz. **21**: 459. 1865.

Leaves said to be 3 to 4 dm. long, 2.5 to 5 cm. wide, deeply channeled, spotted; perianth glaucous without, the tube broadly funnel-shaped, 8 to 10 mm. long, the lobes oblong, 12 mm. long; stamens inserted near the top of the tube; ovary including slender beak 4 mm. long.

Southeastern Texas and northern Mexico.

The flowers here described were collected near Brownsville, Texas, October, 1895 (no. 73), by C. H. Tyler Townsend. The plant is called "huaco," and is supposed to be a remedy for snake bites.

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[a] Diag. Pl. Nov. **3**. 55. 1880.

Although probably common both in Texas and Mexico in the valley of the Lower Rio Grande, yet it has rarely been collected. Townsend's plant is the only specimen we have in the National Herbarium. The only other recorded collection is that of Dr. J. Gregg near Matamoras in 1847.

There is still some doubt as to what is the *A. variegata* of Jacobi, but I have followed Engelmann and Baker in referring the specimen of the Rio Grande there. Be this as it may, *Agave variegata* must be a Manfreda. A species of Central Mexico has been referred to *variegata* by Dr. Watson, which should not be confused with the above. An excellent colored figure of this plant is furnished by Saunders.[a]

10. **Manfreda elongata** Rose, sp. nov.

Stems 9 to 12 dm. high, glabrous throughout; leaves strongly recurved, deeply channeled, 3 dm. or more long, 5 cm. broad, green, the margin entire; flowers rather thickly set; ovary 10 to 12 mm. long; perianth tube cylindrical, 12 to 14 mm. long, brownish; lobes linear, as long as or slightly longer than the tube; stamens about 2.5 cm. long, shorter than the style, inserted just below the top of the perianth tube.

Collected by J. N. Rose in a narrow valley on the west side of the east range of the Sierra Madre in southern Durango, August 16, 1897 (no. 2341).

11. **Manfreda revoluta** (Klotzsch) Rose.

Agave revoluta Klotzsch, Otto & Dietr. Allg. Gartenz. **8**: 274. 1840.

Apparently described from specimens which flowered in the Berlin Botanical Garden in 1840. Described by Baker as having the leaves green, falcate, channeled down the face, and entire on the margin; perianth 3.1 to 3.6 cm. long, the tube equaling the length of the segments. Our labeled specimens, collected by Dr. Palmer at Saltillo, which have been referred here by Dr. Watson, seem to belong rather to *M. brachystachys*.

12. **Manfreda oliverana** Rose, sp. nov.

Leaves about 6, 5 dm. long, at first erect, becoming somewhat bent in age, strongly channeled for two-thirds the length below, flat above, 3.1 cm. broad, acute, the margin entire and smooth to the touch, purplish at base, elsewhere bright green; peduncle, including the spike of flowers, 1.8 m. high, 6 or 8 bracteate below, the lower bracts leaflike, glaucous; flowers (in one specimen) 23, greenish yellow, solitary, sessile; ovary 1.8 cm. long, glaucous; tube 1.6 to 1.8 cm. long, funnel-shaped; segments glaucous without, 1.8 to 2 cm. long, at first, strongly recurved, but in a few days becoming nearly erect, the inner ones toothed on each side near the base; stamens erect, attached one-third the length of the tube from the top, 3.7 cm. long; anthers pale yellow, 1.8 cm. long, style at first protruding from the side of the flowers.

Rootstocks of this Manfreda were collected by J. N. Rose along the road between Colotlan and Bolaños, in the State of Jalisco, September 8, 1897, and were flowered by Mr. George W. Oliver in the Botanic Garden at Washington, August, 1898 (no. 3765).

I have named this species in honor of Mr. Oliver, who has taken great pains and interest in flowering many of my plants.

13. **Manfreda guttata** (Jacobi & Bouché) Rose.

Agave guttata Jacobi & Bouché, Hamb. Gartenz. **21**: 190. 1865.

Agave protuberans Engelm. in Baker, Handbook Amaryl. 197. 1888.

Leichtlinia protuberans Ross, Del. Sem. Hort. Bot. Panorm. 48. 1893.

Leichtlinia commutata Ross, Ic. Descr. Pl. Nov. Rar. 10. 1896.

Leaves 3 to 4 dm. long, spreading, linear to lanceolate, 1.6 to 5 cm. wide, with nearly entire or denticulate margins, dull green with brown spots (not always shown in dried specimens); perianth tube funnelshaped, very short, 6 to 8 mm. long;

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[a] Refugium Botanicum **5**: *t. 326.*

segments purplish, linear, twice as long as the tube; stamens inserted at the top of the perianth tube, 5 cm. long or less; ovary free at the tip; capsule oblong to obovate, less than 2.5 cm. long.

This species, as I have characterized it above, is perhaps the commonest Manfreda in Mexico, except *M. brachystachys*, and seems to be frequent over much of the tableland region. It has been, however, one of the most difficult species for me to make out, and even Mr. Baker only cites a single cultivated specimen. Jacobi (at least I infer so from Engelmann's manuscript) described the flowers incorrectly, for he states that the stamens are inserted at the base of the perianth tube. This seems to have led Engelmann and Baker to separate *A. protuberans*. Hemsley, in the Biologia and elsewhere, and Watson (in Herb.) referred the specimen so separated to *A. guttata*, in which opinion I am inclined to concur.

14. **Manfreda planifolia** (Wats.) Rose.

Agave planifolia Wats. Proc. Am. Acad. **22** : 479. 1887.

Perianth 1.8 cm. long; segments 3 or 4 times as long as the tube; stamens long-exserted. This is one of the broadest-leaved species which I know. Here also has been referred Pringle's No. 2265 from the Sierra Madre near Monterey, State of Nuevo Leon.

Type collected by Mr. C. G. Pringle, "Mapula Mountains, Chihuahua," in 1886 (No. 1141).

15. **Manfreda undulata** (Klotzsch) Rose.

Agave undulata Klotzsch, in Otto & Dietr. All. Gartenz. **8** : 274. 1840.

Leaves 4.5 dm. long, 3 cm. wide, channeled down the face, not spotted, glaucous green, perianth tube 8 mm. long; segments 16 mm. long; insertion of the stamens not given.

This species seems to be known only from plants which flowered in Berlin in 1869.

16. **Manfreda rubescens** Rose, sp. nov.

Bulbs oblong, covered with a dense mass of brown fibers; basal leaves linear-lanceolate, erect, 2 to 2.5 dm. long, 8 to 10 mm. wide, acute, glabrous, green, not spotted; stem leaves 4 to 6, bractlike; peduncle 6 to 9 dm. high; flowers few (5 to 8), alternate, sessile, dark purple, 3.2 to 3.6 cm. long, including the ovary and stamens; ovary smooth, 8 to 10 mm. long; perianth tube very short, 2 to 4 mm. long; segments 1.2 cm. long; stamens 2.5 cm. long, inserted at the top of the tube; ovary free at tip.

Only a few specimens seen in one locality, a small grassy opening along a little stream in the western foothills of the Sierra Madre near Pedro Paulo, Territorio de Tepic, August 4, 1897 (no. 1994).

This species is perhaps nearest *M. guttata* (*A. protuberans*), but has fewer and smaller flowers, and very different leaves.

17. **Manfreda jaliscana** Rose, sp. nov.

Leaves almost 6 dm. long, 1 cm. wide; perianth tube, 4 to 8 mm. long; lobes oblong, 12 to 14 mm. long, 3 mm. wide, purplish; stamens, 7.5 cm. long, inserted near or at the top of the tube, purplish; anthers, 12 mm. long; ovary slightly glaucous; capsule oblong, 3 cm. high, constricted at base into a short stipe, apiculate at tip.

Collected by Mr. C. G. Pringle near Gaudalajara, December, 1889 (no. 1850), and distributed as *A. variegata*, but very different from that species, at least as understood by Baker, Engelmann, and others. I have not seen Jacobi's original description, but from notes left by Engelmann, which are apparently copied from Jacobi, I am inclined to think that the Texas plant, which goes under the name of *A. variegata*, is properly so referred. Also collected by E. W. Nelson, west Mexico, 1903 (no. 6872).

In 1899 I found bulbs of this same species very common in the market at Guadalajara, and a small quantity were obtained and sent home. One of these flowered in April, 1900 (no. 109).

SPECIES IN CULTIVATION.

The following species of Manfreda have been reported, under the name Agave, as in cultivation, and as having been introduced at the dates appended:

aliberti, 1882.
brachystachys, 1820.
conduplicata, ——.
maculata, 1859.
maculata minor, 1869.
maculosa, 1856?.
revoluta, 1840.
undulata, 1840.
variegata, 1865.
virginica, 1765.

ARISTOLOCHIACEAE.

NEW NAME FOR AN ARISTOLOCHIA.

Aristolochia pringlei Rose, nom. nov.

Aristolochia longecaudata Wats. Proc. Am. Acad. **22** : 447. 1887, not Masters, 1875.

The writer collected in 1899, about the little town of Tequila, an Aristolochia which proved to be *A. longecaudata* Watson, a species only known heretofore from the plains near Guadalajara, where it was first obtained by Palmer and afterwards by Pringle. Mr. Pringle has recently called my attention to the fact that there is an *Aristolochia longecaudata* of Masters. As the name was not found in the Kew Index, the first impression was that Masters's name must be later, but it really has a precedence of some twelve years.

Specimens examined:

Jalisco: Near Guadalajara, Dr. E. Palmer, 1886 (no. 287); same station, C. G. Pringle, 1893 (no. 4425); near Tequila, J. N. Rose and Walter Hough, 1899 (no. 4764).

PAPAVERACEAE.

THE MEXICAN SPECIES OF ARGEMONE.[a]

Linnæus, in the first edition of the Species Plantarum, assigned three species to the genus Argemone. Only one of these, *A. mexicana*, remains in the genus as we understand it to-day, and this is clearly the historical type. The genus dates back to Tournefort, who only knew one species, that now called *A. mexicana*.

Hemsley, in the Biologia, assigns five species to Mexico, but two of these (*A. grandiflora* and *A. ochroleuca*) he thought were probably varieties of *A. mexicana*.

Prain, in an exhaustive and scholarly review of the genus, has brought together the results of much bibliographical study, but in his treatment of the species is not very satisfactory. He recognizes but six species belonging to this genus, five of which are credited to Mexico.

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[a] **Argemone** L. Sp. Pl. **1** : 508. 1753.

ENOMEGRA A. Nelson, Analyt. Key Pl. Rocky Mts. 27. 1902.

Type species of Argemone, *A. mexicana* L.; of Enomegra, *A. hispida* Gray.

The writer has seen at least eleven species of Argemone from Mexico and nearly all of them he has actually collected. Several other species have been described by various writers, but these are not easily made out. They have all gone into synonymy, where perhaps they should remain. All of the species are common and the genus has a wide distribution, both laterally and altitudinally. The various species seem to prefer cultivated ground to the unbroken soil and are therefore most commonly found in neglected fields and along railroad tracks.

If Mr. A. Nelson's genus Enomegra based on *Argemone hispida* possesses no other characters than those cited in the original place of publication, viz, thick milky-white sap and densely bristly stems and leaves, it can hardly be taken seriously.

KEY TO SPECIES.

- *Flowers yellow.*
  - *Stems woody* .... 1. *A. fruticosa.*
  - *Stems herbaceous.*
    - *Styles none; flowers bright yellow* .... 2. *A. mexicana.*
    - *Style evident; flowers pale yellow* .... 3. *A. ochroleuca.*
- *Flowers not yellow (mostly white).*
  - *Back of sepals not prickly; fruit nearly smooth* .... 4. *A. grandiflora.*
  - *Back of sepals more or less prickly; fruit prickly.*
    - *Flowers pinkish or purple* .... 5. *A. sanguinea.*
    - *Flowers white.*
      - *Stems and leaves setose as well as densely prickly* .... 6. *A. hispida.*
      - *Stem and leaves not setose and less densely prickly.*
        - *Filaments purple.*
          - *Style slender* .... 7. *A. arida.*
          - *Style wanting* .... 8. *A. platyceras.*
        - *Filaments yellow.*
          - *Petals small and narrow* .... 9. *A. stenopetala.*
          - *Petals large and broad.*
            - *Stems stout, very prickly* .... 10. *A. munita.*
            - *Stems weak, much less prickly* .... 11. *A. gracilenta.*

1. **Argemone fruticosa** Thurber; Gray, Mem. Am. Acad. II. **5** : 306. 1854.

Specimen examined:

Coahuila: At San Lorenzo de Laguna, E. Palmer 21, 1880

Type locality: "In the mountain pass of La Pena, Coahuila."

2. **Argemone mexicana** L. Sp. Pl. **1** : 508. 1753.

Type locality: "Mexico, etc."

The writer, who has traveled extensively over Mexico and has looked expressly for this species, has never seen it in all the western or central part of the country. Indeed, he has only once collected it and then about Oaxaca City, where it could easily have been introduced. These observations are in line with Prain, who states that the species is found in Mexico only as an introduced plant, generally in the neighborhood of seaport towns.

All herbarium material seen is from Guatemala and extreme south Mexico.

3. **Argemone ochroleuca** Sweet, Brit. Fl. Gard. **3** : *pl. 242.* 1828.

Argemone mexicana ochroleuca Lindl. Bot. Reg. **16** : *pl. 1343.* 1830.

This species is common all down the west coast of Mexico, and was the only species of the genus seen by the writer south of Guaymas. In the interior it was seen from Chihuahua City to Oaxaca City and it is the most common argemony of Mexico. It is usually seen about houses and towns growing in waste places. The flowers are always a very pale lemon yellow. The fresh flowers sometimes appear nearly white, but the yellow color comes out more strongly in drying.

Prain, in his monograph of this genus, keeps *ochroleuca* as a variety of *mexicana*, although with some misgivings. It seems to the writer that the two forms should be kept distinct, for besides the differences cited by Prain our own material of *ochroleuca* shows somewhat thicker leaves, with stouter, more spinescent teeth. The color of the flowers is pale lemon, while that of *mexicana* is always orange yellow.

Type locality: Original description drawn from specimens grown from Mexican seed.

The following specimens have been collected by J. N. Rose:

Sonora: Between Nogales and Guaymas, June 4, 1897 (no. 1297); near Guaymas, June 5 to 11, 1897 (no. 1252).
Tepic: Near Acaponeta, July 30, 1897 (no. 3286).
Chihuahua: Near Chihuahua City, May 11, 1899 (no. 4207).
Federal District: Hill near Guadalupe, Valley of Mexico, June 10, 1899 (no. 4542).

4. **Argemone grandiflora** Sweet, Brit. Fl. Gard. **3**: *pl. 226.* 1827.

Stems with very few prickles and glaucous; leaves somewhat prickly on the margins and midrib. Sepals 3, broadly ovate, tapering into a long acumination tipped with a weak prickle; flowers white, 10 cm. broad; stamens numerous, yellow; ovary bluish, slightly prickly; style short but evident.

Collected by Rose and Hough at Cardenas, San Luis Potosi, July 15, 1899 (No. 4884) and seen for a stretch of perhaps 50 miles between this place and the city of San Luis Potosi.

This must be the true *A. grandiflora*, now common in gardens, but according to Dr. Prain, represented in herbaria by only a single specimen in the Paris herbarium, collected by Ghiesbrecht in the State of Oaxaca.

Besides several good herbarium specimens, a small quantity of seed was obtained. The above description is drawn from my own specimens, which seem to accord with the illustrations in the Botanical Register[a] and the Botanical Magazine.[b] This species was introduced into cultivation in 1827.

5. **Argemone sanguinea** Greene, Pittonia **4**: 68. 1899.

Argemone mexicana rosea Greene, loc. cit. as syn.

Argemone platyceras rosea Coulter, Contr. Nat. Herb. **1**: 30. 1890, not *A. rosea* Hook. 1831.

Stems slender, very prickly and glaucous, leaves pale, pinnately lobed; the lobes with broad spiny-tipped teeth; flowers on short peduncles, pinkish to deep purple, 6 to 10 cm. broad; sepals broad, 18 mm. long, tipped with a long spine; fruit linear-oblong, 3 to 5 cm. long; style almost wanting.

Type locality: "Corpus Christi, Texas," collected by G. C. Nealley.

Specimens examined:

Texas: Eagle Pass, V. Havard, April, 1883; same station, C. G. Pringle, 1900 (no. 8277).
Coahuila: Saltillo, Dr. Palmer, 1880 (no. 20) and 1898 (no. 325), and near Parras, 1898 (no. 442).

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[a] Pl. 1264.

[b] Pl. 3073.

6. **Argemone hispida** Gray, Pl. Fendl. 5. 1849.

Described as perennial, stout; stems very pale and of a glaucous cast, densely setose-prickly as well as setose; leaves setose and prickly; flowers large, white, nearly sessile; capsule pale, rather narrow, oblong, prickly and setose like the stem; style short but distinct.

The following material from Mexico seems to belong here:

Coahuila: At Saltillo, Dr. E. Palmer, 1880 (no. 19) and 1898 (no. 208).

Type locality: "Around Santa Fe," New Mexico.

Miss Eastwood[a] has called attention to the distinctness of this species from the so-called *A. platyceras* of the United States. As is shown elsewhere in this paper, the true *platyceras* is not to be expected in the United States.

To *A. hispida* I am inclined to refer *A. squarrosa* Greene,[b] which came also from New Mexico.

7. **Argemone arida** Rose, sp. nov.

Stems branching, pale and somewhat glaucous, with scattered prickles, but not hispid; leaves pinnately lobed, the lobes with spiny-tipped teeth; flowers subsessile, 7 to 8 cm. broad, white; sepals with scattered prickles, the horns narrow, ending in a long prickle; petals rather broad at base; stamens numerous, purplish; ovary and capsule very prickly, somewhat glaucous, narrowly oblong, the walls rather firm; style very distinct, at least 2 to 3 mm. long.

Collected by J. N. Rose and Walter Hough on the arid plains about San Luis Potosi, Mexico, July 13, 1899 (no. 4864).

This species is very different from the one described below as *A. platyceras*, especially in its capsule, style, etc.

8. **Argemone platyceras** Link & Otto, Ic. Plant. Rar. Hort. Berol. **1**: 85. *pl. 43.* 1831 (?).

Stems 5 to 8 dm. high, somewhat diffuse, prickly; leaves pinnately lobed, the lobes strongly toothed and spiny-tipped; flower buds in clusters; peduncles even in fruit very short; flowers very large, 7 to 15 cm. broad, white, sometimes drying yellowish; sepals bristly, broad, the flat acumination also bristly and ending in a spine (not shown in original drawing); stamens purple; fruit ovate-oblong, 3.5 to 4 cm. long, thin-walled, very prickly; stigmas large, sessile; seeds with coarser reticulations than in *A. mexicana*.

Specimens examined:

Puebla: Between Tepeaca and Santa Rosa, J. N. Rose, June 27, 1899 (no. 4730).
Mexico: Near Ozumba, J. N. Rose, July 6, 1901 (no. 5355).
Federal District: At Ajusco, July 4, 1901 (no. 5306).
Vera Cruz: Las Vegas, J. N. Rose, May 17 to 22, 1899 (no. 4288).

Seeds of this species were brought home from Mexico in 1899 (Rose no. 4730), and these flowered in July, 1900, and the following notes were made at that time: Stems 4 dm. high, erect and simple, only slightly prickly, a little glaucous; the 3 inner petals much smaller than the outer; stamens reddish; stigmas 4, sessile.

The type of this species is said to grow "in Cofre de Perote prope Hacienda de la Laguna." Just what is meant by this statement is not clear. The "Hacienda de la Laguna" is near Jalapa, Vera Cruz. A more accurate statement would probably be "above Hacienda de la Laguna toward the Cofre de Perote." Mr. Pringle and the writer collected on the mountains above Jalapa, and consequently near the type locality, a plant which seems to answer in all essential particulars to Link and Otto's figure.

A. platyceras is certainly to be kept distinct from our United States and northern Mexican forms.

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[a] Zoe **4**: 4.

[b] Pittonia **4**: 68.

9. **Argemone stenopetala** (Prain) Rose.

Argemone intermedia stenopetala Prain, Journ. Bot. **33**: 364. 1895.

Stems apparently annual, glaucous, and with scattered weak prickles, flowers subsessile, very small, white; petals lanceolate, 1.5 to 2 mm. long; fruit ovate-oblong, 2.5 to 3 cm. long, prickly; style short.

Specimens examined:

Chihuahua: In valley near Chihuahua City, C. G. Pringle, 1885 (no. 43); same locality, J. N. Rose, 1899 (no. 4206).

The writer found this species growing associated with *A. ochroleuca*, from which it is difficult to distinguish it except by the color of the flowers.

Type locality: "Chihuahua City."

10. **Argemone munita** Dur. & Hilg. Pac. R. Rep. **5**^{3}: 6. *pl. 1.* 1855.

Type locality: "Williamson Pass," California.

The writer has not examined the type of *A. munita* and the following specimens may belong elsewhere. They are quite different, however, from all our other Mexican material.

Specimens examined:

Sonora: Between Nogales and Guaymas, J. N. Rose, June 4, 1897 (no. 1299).

Chihuahua: St. Diego, C. V. Hartman, May 8, 1891 (no. 673); Casas Grandes, E. A. Goldman, May 29, 1899 (no. 416).

The writer found this species very common along the railroad running between Nogales and Guaymas. The large pure white flowers are often 8.5 cm. in diameter.

11. **Argemone gracilenta** Greene, Pittonia **3** : 346. 1898.

A slender plant; branches pale, armed with scattered long slender prickles; leaves slightly lobed, very prickly; flowers sessile or nearly so; sepals broad, prickly on the back and terminating in a long prickle; petals white, 3 cm. long; fruit seen immature, oblong, prickly; style very short.

Only known from Dr. E. Palmer's plant from Lower California, collected in 1887.

Type locality: "Muleje, Lower California."

Professor Greene says it is a "species of well-defined aspect and indisputable characters."

RANUNCULACEAE.

NEW SPECIES OF THALICTRUM.

Since my notes on some Mexican species of Thalictrum were published in volume 5 of the Contributions, I have given further attention to the genus, both in the field and in the study. Although considerable work must yet be done on our Mexican species, the following do not seem to be involved in the confusion and their publication need not be delayed longer.

Thalictrum obliquum Rose, sp. nov.

Stems slender, much branched above, glaucous, glabrous throughout, including the leaflets; leaves 3 or 4 times ternate, broad in outline; leaflets small, nearly orbicular or ovate, few-toothed or lacerate above, obliquely truncate, sometimes cuneate, the terminal ones sometimes cordate at base; inflorescence a narrow panicle; stamens shortly apiculate; akenes strongly reticulate-nerved, glabrous.

Collected by C. G. Pringle on bluffs at Amozoc, Puebla, September 10, 1901 (no. 9541).

I should assign this species to a position near *T. gibbosum*, but the leaflets are more deeply cleft and greener beneath, and the anthers distinctly but shortly apiculate.

Thalictrum peninsulare (Brandegee) Rose.

Thalictrum vesiculosum peninsulare Brandegee, Zoe 4: 399. 1894.

Mr. Brandegee describes it as follows:

"*Thalictrum vesiculosum* Lec. var. *peninsulare*. Plants about 1 m. high, glabrous throughout, excepting a minute glandular pubescence on the margins of the sheaths, somewhat glaucous; stems striate; leaves tripinnate, distant; leaflets slender-petioulate, thin, sometimes 3 cm., but ordinarily less than 2 cm. long, green above, glaucous below, spatulate, ovate or obovate, 3 to 6, commonly, 3-lobed at apex, the lobes entire; panicle loose and spreading somewhat leafy; pedicels elongated, filiform; flowers usually hermaphrodite; sepals 4, 2 mm. long, oblong-elliptic or oval, purplish, with conspicuous parallel veins; filaments filiform, flexuous, more or less dilated toward the top, in full development exceeding the linear 4 to 5 mm. long, mucronate anthers, ovaries about 5, stipitate; style filiform 6 to 8 mm. long, strongly papillose on the back, tapering to the extremity, stigmatic nearly the whole length, the thin margin rolled in; heads nodding in fruit, akenes 5 to 6 mm. long, usually concave on the inner angle, stipitate, tipped by more or less of the base of the style, the flattened sides and back strongly veined and nodulose.—Common at middle elevations in the mountains of the Cape Region.

"This plant is geographically so far removed from the South American type that comparison of specimens may show them to be specifically distinct."

Thalictrum jalapense Rose, sp. nov.

Stems 9 to 10 dm. high, glaucous; leaves 3 or 4 ternate; leaflets small, nearly orbicular, 1 to 1.5 cm. in diameter, glabrous above, pubescent by short papillose hairs beneath, few-toothed, strongly cordate at base; inflorescence paniculate; sepals purplish, somewhat glandular; stamens long, mucronate-tipped; akenes small, strongly reticulate-nerved.

Collected by J. N. Rose near Jalapa, August 17, 1901 (no. 6188).

This species comes near *T. strigulosum* Hemsley, but has smaller leaflets and these glabrous above, glandular sepals, etc. It is also found at much lower altitudes.

Thalictrum stipitatum Rose, sp. nov.

Stems 18 to 30 cm. high and closely resembling *T. obliquum*, except that the leaflets are even smaller and often entire, at most with a single tooth on a side, and the akenes more tapering at base, forming a very decided stipe.

Collected by C. G. Pringle in a wet barranca above Cuernavaca, altitude 1,950 meters, September 21, 1896 (no. 6511), and distributed as *T. gibbosum*.

Thalictrum subpubescens Rose, sp. nov.

Rather stout, 9 to 15 dm. high, with glabrous or glabrate stems; leaves large, broad in outline, 3 or 4 times ternate, the rachis and under surface of leaflets softly pubescent; leaflets orbicular, rather large, 2 to 3 cm. in diameter, with a few rounded teeth, glabrous above; inflorescence paniculate; anthers long-apiculate; akenes strongly reticulated.

Collected by C. G. Pringle on moist banks in Sierra de las Cruces, altitude 3,000 meters, August 14, 1896 (no. 6414).

Perhaps nearest *T. tomentellum* Rob. & Sea., but stouter, with larger leaflets, these glabrous above, etc.

BRASSICACEAE.

NEW SPECIES OF DRABA.

Heretofore only four species of Draba have been known from Central Mexico. The five new species here proposed have been repeatedly compared with the descriptions of these old ones. Several of the new descriptions have been in manuscript for seven or eight years. Two of the old species, viz: *D. myosotioides* and *D. popocatepetlensis*, have been collected by the writer at their type localities in great abundance. The other two (*D. jorullensis* and *D. tolucensis*), although known from descriptions only, seem to be quite distinct from any of these.

Draba confusa Rose, sp. nov.

Annual or perhaps biennial, erect, 3 dm. or so high, somewhat stellate-pubescent, basal leaves oblong-linear, 4 to 5 cm. long, obtuse; stem leaves similar, subentire; inflorescence strict, 1 to 2 dm. long; pedicels spreading 3 to 10 mm. long; petals yellow, longer than the sepals; pods ovate-oblong, 10 to 12 mm. long, pubescent; style prominent, less than 1 mm. long; stigma broad; cells each 4 to 6 seeded.

Collected by C. G. Pringle under cold cliffs of Sierra de las Cruces, altitude 3,600 meters, October 7, 1895 (no. 5260).

This was distributed as *D. myosotoides*, from which it is abundantly distinct in its pods, style, etc.

Draba mexicana Rose, sp. nov.

Biennial or perhaps perennial, more or less branching, more or less stellate-pubescent; basal leaves not seen; stem leaves scattered, oblong or the upper ones linear, obtuse, few-toothed, nearly glabrous; inflorescence open, elongated, 1 dm. long; pedicels 5 to 7 mm. long; sepals orbicular, tinged with purple, glabrous; petals longer than the sepals, pale yellow; pods ovate, 5 mm. long, slightly pubescent; cells about 4-seeded; style distinct, less than 1 mm. long.

Collected by C. G. Pringle on Sierra de Ajusco, Federal district, altitude 3,000 meters, August 8, 1896 (no. 7385).

This was distributed as *D. myosotoides*, but differs from it in its longer style, and in its foliage, etc.

Draba nivicola Rose, sp. nov.

Low perennial growing 2.5 to 5 cm. high with a thick caudex densely covered with bases of the old leaves; root thick, branching below, about 5 dm. long; stems arising from the caudex numerous; leaves very many, spatulate, 10 to 14 mm. long, obtuse, entire, densely stellate-pubescent on both sides or becoming glabrate above; flowers bright yellow; sepals glabrous, oval, obtuse; petals a little longer than the sepals, obtuse, tapering at the base into a claw, 2 mm. long; pod ovate, nearly glabrous, 6 mm. long.

Collected by E. W. Nelson on Mount Orizaba, April 22, 1893 (no. 4) and 1894 (no. 280), and on Cofre de Perote, May, 1893; also by J. N. Rose on Mount Orizaba, July 26, 1901 (no. 5766, type).

It is very near *D. orbiculata* in habit and foliage, but very different in the shape of the pod, while the leaves are a little shorter and of different shape.

Draba orbiculata Rose, sp. nov.

In habit, foliage, and pubescence this species is strikingly similar to *D. nivicola*, but the fruit is so very different that I feel no hesitancy in describing it as also new.

Pedicels rather stout, 5 mm. long, spreading; fruit orbicular, 2 mm. in diameter, glabrous; style thick, 0.5 mm. long; seeds 2 to each cell, attached near the top of cell; flowers not seen.

Only known from specimens collected in porphyritic gravel of the crater of Nevado de Toluca by C. G. Pringle. September 2, 1892 (no. 4234). This was distributed as "*Draba tolucensis* H. B. K. ?" I feel convinced that *D. tolucensis* must be quite distinct from the above.

Draba pringlei Rose, sp. nov.

Perennial from a much-branched caudex, the lower parts covered with old leaf bases; basal leaves thin, 2 cm. long, spatulate, tapering at base into a broad petiole, the margin ciliate, the two surfaces smooth or with a few hairs either simple or stellate; branches about 1 dm. high, nearly naked below, somewhat subdivided above; spikes short and compact; pedicels spreading, 5 mm. long, stellate-pubescent; petals (at least in old specimens) white; pods ovate, of a deep bluish-green color, 4 mm. long; style very short; ovules about 6 in each cell.

Collected by C. G. Pringle on the colder slopes within the crater of the Nevado de Toluca, altitude 4,080 meters, September 1, 1892 (no. 4248). It was distributed as "*Draba jorullensis* var.," but it hardly answers to that species. Here also seems to belong the plant described by Mr. Hemsley in the Biologia[a] as *D. tolucensis*, as it agrees with mine in color of flowers, and in its short style, hairy pods, etc.

The true *D. tolucensis* was found on the low hills about Toluca (altitude 2,400 meters) and must be very different from this species, which comes from the top of Nevado de Toluca.

ROSACEAE.

TWO NEW SPECIES OF POTENTILLA.

Potentilla madrensis Rose, sp. nov. PLATE III.

Stems from a thick root, branching at base, ascending 2 to 4 dm. long, glabrous below, somewhat villous and glandular-pubescent above, leaves mostly basal and long-petioled; stipules small; leaflets 3, glabrous and green on both sides, rounded at apex, crenately toothed, 20 to 25 mm. long, obovate to oblong; sepals ovate, acute; bracts linear; petals purplish, longer than the sepals.

Collected by J. N. Rose near Santa Gertrudis, Tepic, August 8, 1897 (no. 2096).

Nearest *P. thurberi*, but very different in habit, number of leaflets, etc.

EXPLANATION OF PLATE III.—Plant, natural size.

Potentilla rydbergiana Rose, sp. nov. PLATE IV.

Stems from a thick, much-branched caudex, villous-pubescent, the parts above ground usually simple and bearing a single terminal flower; basal leaves digitately foliate; leaflets 5, obovate, 1 to 2 cm. long, with a few coarse obtuse serrations, glabrous above, with a few long hairs beneath; stipules lanceolate, entire; petiole as long as or longer than the leaflets; flowering stems slender, ascending, 1 dm. or less long, bearing 1 to 4 much reduced leaves; calyx lobes ovate and acute; bractlets somewhat shorter and broader with the apex rounded; petals bright yellow, 1 cm. long, retuse.

Common on rocks on the high mountains above Pachuca, Hidalgo.

Collected by C. G. Pringle, August 3, 1898 (no. 7646, type), and July 21, 1901 (no. 8549), and by J. N. Rose, July 21, 1901 (no. 5607).

This species has much the habit of *P. ranunculoides*, but has fewer and different flowers.

The specific name is given in honor of Dr. P. A. Rydberg, who has monographed the genus.

EXPLANATION OF PLATE IV.—Plant, natural size.

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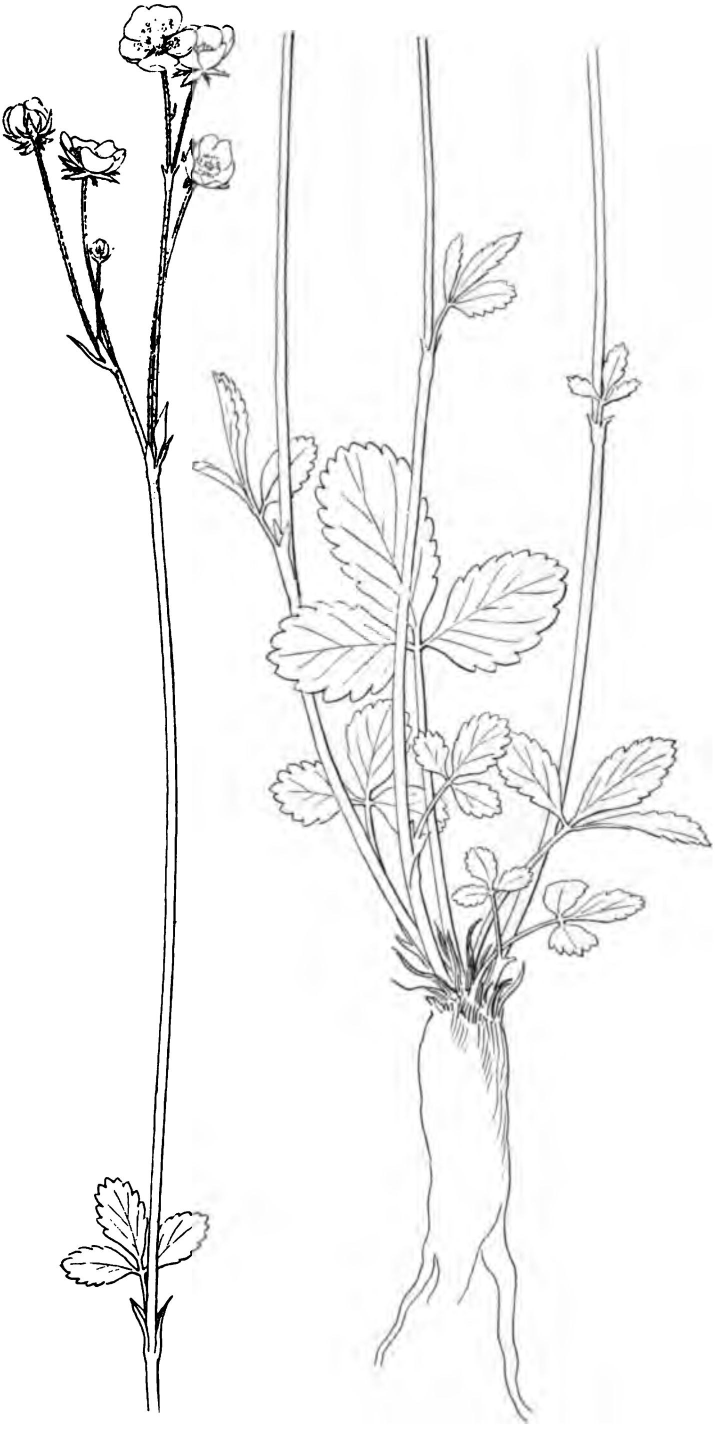
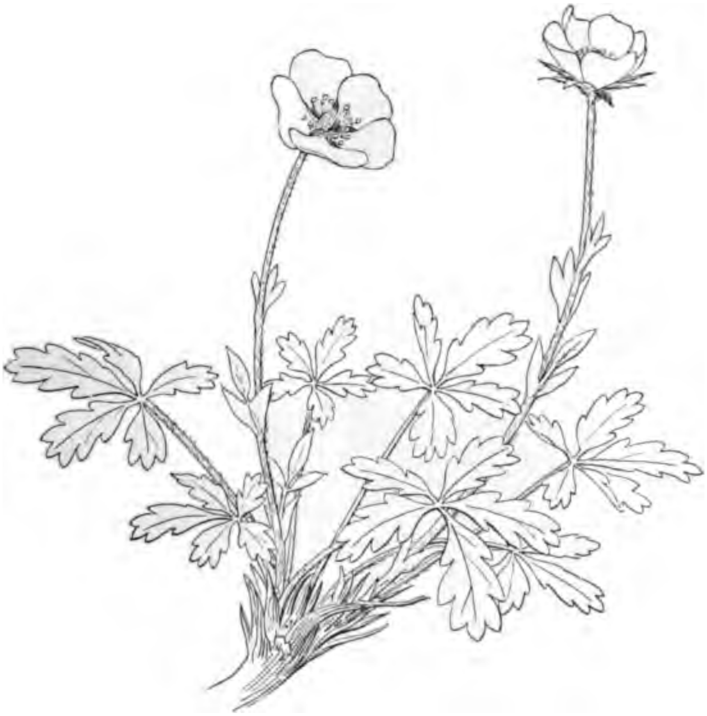
[a] Biologia Centrali-Americana 2: 34.



POTENTILLA MADRENSIS ROSE.



POTENTILLA RYDBERGIANA ROSE.

MIMOSACEAE.

NEW SPECIES OF ACACIA, MIMOSA, AND PITHECOLOBIUM.

Acacia ambigua Rose, sp. nov. FIGURE 7.

Low, somewhat diffuse shrubs, 12 to 20 dm. high, pubescent (even on the old wood and thorns), infrastipular spines long and slender; compound leaves much reduced, subsessile; pinnæ 1 pair; leaflets 1 pair, 8 mm. long, oblong, obtuse, slightly pubescent; flowers in slender spikes; legumes linear, 7 to 8 cm. long, densely silky pubescent.

Collected on the hills about Matamoras, Puebla, where it is common, by J. N. Rose and Walter Hough, June 26, 1899 (no. 4698, type), and near Yautepec, Morelos, by J. N. Rose, July 5, 1901 (no. 5342).

This species belongs to the *amentacea* group but differs from all the related species in its silky pods, etc.

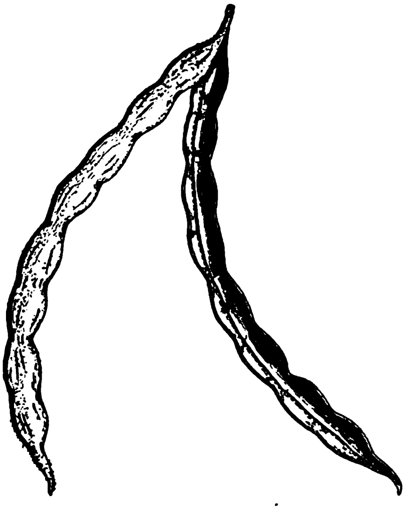


FIG. 7.—Pods of *Acacia ambigua*.

Acacia compacta Rose, sp. nov.

A large, round bush 2 to 3 meters high; old branches shining, reddish brown; young branches grayish pubescent; leaves rather small; rachis and under surface of leaflets somewhat silky pubescent; pinnæ 2 to 5 pairs, 8 to 12 mm. long; leaflets 12 to 15 pairs, narrowly oblong, 1 to 1.5 mm. long, obtuse; flowers yellow in dense spikes 2.5 to 3 cm. long; spikes solitary or in pairs forming short naked racemes; calyx minute, silky; corolla twice as long as calyx; stamens numerous, distinct; legume oblong, flat and thin, 1 dm. long, 16 mm. broad, acute at apex, shortly stipitate.

Collected by J. N. Rose and Walter Hough in Tomellin Canyon, Oaxaca, June 24, 1899 (no. 4680).

No fruit could be found on the plant, but a single pod, as above described, was picked up under the bush. It appeared to belong to it, but I realize that there is always more or less risk in collecting and describing detached fruit of any of the Mimosae. It is a rule of the writer always to take fruit and flowers when possible from the same shrub. This species seems to be related to *A. acatlensis* Benth., but differs in several important respects. It seems best to describe the plant as new.

Acacia sonorensis Rose, sp. nov.

Shrubs; branches pubescent; pinnæ 1 pair; petiole (very short) and rachis pubescent; leaflets 2 or 3 pairs, oblong, obtuse, slightly pubescent, 6 to 12 mm. long; spikes slender, with very hairy rachis, 2.5 to 3 cm. long; legume (immature) linear, becoming glabrate.

Collected by J. N. Rose, near Guaymas, Sonora, June 5 to 11, 1897 (no. 1247). Similar to *A. amentacea* but of different range, with pubescent leaves, etc.

Acacia macilenta Rose, sp. nov.

A handsome tree, 6 meters high; the trunk 7.5 to 12.5 cm. in diameter; leaves large, often with 25 pairs of pinnæ; petioles short, bearing a large oblong gland; spikes 10 to 12 cm. long, in pairs, often forming terminal racemes 2.5 dm. long; flowers sweet-scented; legume with thin valves covered with a close tomentum.

Collected by Dr. E. Palmer on river bottoms and mountain sides near Colima, January 9 to February 6, 1891 (no. 1209).

In reporting upon Dr. Palmer's Colima plants the writer referred this species to *A. coulteri*. Since then abundant material of the true *coulteri* has been collected by Mr. Nelson which shows this to be quite distinct.

Acacia occidentalis Rose, sp. nov.

A small tree or shrub, pubescent; petiole pubescent, bearing a gland above the middle; pinnæ, 2 to 4 pairs; leaflets, 5 to 13 pairs, linear, 3 to 5 mm. long, at first puberulent, becoming glabrate in age, midvein near the upper margin; flowers in heads, often 4 or more together, from the axils of the leaves; pods 7 cm. or less long, 2 cm. broad, stipitate, thin, glabrous.

Only known from Sonora.

Collected along railroad between Nogales and Guaymas by J. N. Rose, June 4, 1897 (no. 1294, type); near Altar, C. G. Pringle, April, 1884; Alamos, Dr. E. Palmer, 1890 (no. 315). This species has been distributed as a variety of *A. malacophylla*, but under a name which can not properly be used. It is clearly not that species, differing especially in the size and veining of leaflets, texture of pods, etc.

The species is very common on the dry plains of central Sonora. Here it appears as a low shrub, but doubtless because the largest plants have been cut away. Dr. Palmer states that about Alamos it sometimes appears as a small tree, and that it is there much used as fuel.

Acacia unijuga Rose, sp. nov. FIGURE 8.

A large tree with the wood white and very hard and durable; old branches grayish and glabrous; new branches pubescent; stipules spinescent, small in specimens seen; common petiole short, 2 cm. or less long; pinnæ 1 pair; leaflets 2 pairs, oblong to orbicular, 2 to 4 cm. long, rounded at apex sometimes mucronulate, glabrous, midrib somewhat to one side; secondary rhachis narrowly winged; flowers small, yellow, in slender spikes (2½ to 3 cm. long), borne in clusters in the old leaf axils, peduncle bracteate at base; legume narrowly oblong, about 12 cm. long, 1.8 to 2.5 wide, acute at apex, stipitate at base, flat and thin.

Collected by Mr. C. G. Pringle in the lowlands near Tampico in 1899 (no. 6989). One of the most common trees in the lowland forests from the Gulf coast to the edge of the table-land.

Mr. Pringle states that this is a very useful wood and is much used for railroad ties above Tampico.

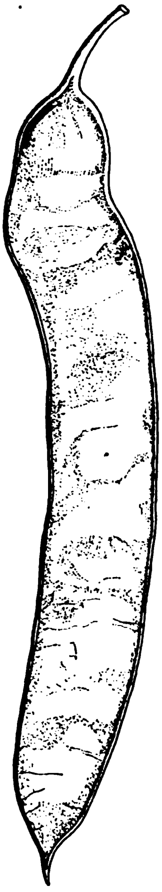


FIG. 8.—Pod of *Acacia unijuga*.

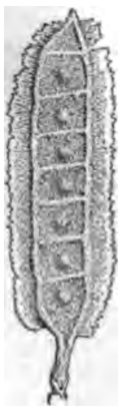


FIG. 9.—Pod of *Mimosa hemiendyta*.

Mimosa hemiendyta Rose & Robinson, sp. nov. FIGS. 9 AND 10.

Shrub 3 to 6 meters high, with stiff, subflexuous, divaricate, terete branches, armed at the nodes with pairs of short, conical, reddish, scarcely recurved thorns, and covered on one side by a short, dense, rufous tomentum, on the other side by a finer, less copious, at length obsolete, gray tomentum; petioles 3 to 10 mm. long, with similar bichromatic pubescence; leaf rachis 1.2 to 1.8 cm. long; pinnæ 4 pairs, 1.5 to 2.5 cm. long; leaflets about 7 pairs, oblong, subtruncate at both ends, bright green and glabrate above, pubescent and slightly paler beneath, 7 mm. long, 3 mm. broad; flowers in globose heads; peduncles (in fruit) 1.2 cm. long, tomentose; corolla glabrous, 4 or 5 toothed; the teeth ovate, acutish; stamens, twice as many; pods narrowly oblong, thin, flat, rufous-tomentulose, 4.5 cm. long, 1.2 cm. broad, slender-stiped, about 8-seeded, divided into as many nearly quadrate segments, and bordered by a thin, erose, purplish wing.

Collected by E. A. Goldman, at Apagote, near Yohaltun, State of Campeche, December 31, 1900 (no. 513). Type in U. S. National Herbarium; fragment in herb. Gray. Related to *M. galeottii* and *M. mollis*, but with the very peculiar pods of Mr. Rose's recent species *M. lacerata*.

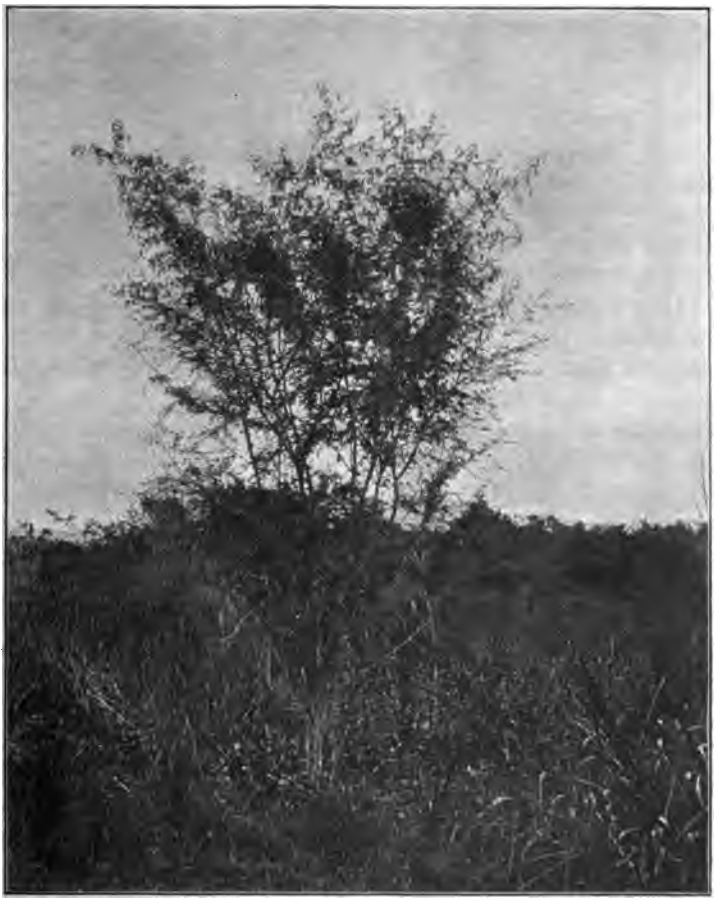


FIG. 10.—*Mimosa hemiendyta* Rose & Robinson.

Pithecolobium compactum Rose, sp. nov.

A low spreading compact bush, hardly rising above 3 to 5 dm. in height; branches usually stunted and short bearing short straight stipular spines, the old branches light gray, the young ones pubescent; leaves small and much reduced; pinnæ one pair, 8 to 15 mm. long; petiole very short (1 to 4 mm. long), pubescent, bearing a small gland at the top; leaflets 5 to 7 pairs; oblong to almost orbicular, rounded at apex, 2 to 4 mm. long, thickish, glabrous and shining above, dull and glabrous beneath except for some crisped hairs on or near the margin; heads solitary, in the axils of leaves, 5 mm. long; calyx minute, 0.5 mm. or less long; corolla much longer (3.5 mm. long), glabrous, the margins of the lobes reddish; stamens yellowish, numerous, united below into a slender tube 4 mm. long; anthers minute, reddish; pods shortly stipitate, strongly curved, forming a half circle or even more strongly curved, 10 to 12 mm. broad, about 8 cm. long, when green rather turgid, but the valves after breaking apart flat, covered with a fine pubescence; seeds black, somewhat flattened, circular or somewhat angled, 1 cm. broad, attached to the pod by a long funiculus.

Collected by J. N. Rose on the flat plain west of Tehuacan, Puebla, August 1, 1901 (no. 5840).

In the field this species resembled very closely *P. palmeri*, but it differs in so many details that I feel justified in treating it as I have.

VICIACEAE.

SYNOPSIS OF THE SPECIES OF COLOGANIA.

The genus Cologania is entirely American and is restricted almost wholly to Mexico. Four species are found in the United States, but they belong to the border country and all probably extend into Mexico. About three species are found in Central America, one at least extending into Mexico. Three species have been described from South America, two of which have been reported from Mexico, although perhaps only one really extends so far.

This genus was established by Kunth in 1823 and was based on the two species *C. procumbens* and *C. angustifolia*. Bentham and Hooker in the Genera Plantarum state that there are four or five species, while the Kew Index recognizes thirteen, all but one being assigned to North America. A careful study of much Mexican material indicates that the number of species is much larger than was supposed. Some twenty-six species are here recognized from Mexico alone.

The genus is a very consistent one, being readily distinguished from related genera by its slender tubular calyx. The species are rather difficult to distinguish, the best characters being in the habit and foliage and in the pubescence of the leaflets and calyx. There are probably good characters in the pods, but very few specimens have been collected in fruit. There is a great display of species in the mountains and table-land region of Mexico. The writer has collected twenty-nine numbers representing some ten species.

The four United States species have not been frequently collected, although three of them have been in our large herbaria for more than fifty years. Two of these were taken for species of Humboldt collected by him in the mountains of central Mexico, but a careful study of the original descriptions seems to justify their separation.

The United States species are easily distinguished by the subjoined key.

KEY TO UNITED STATES SPECIES.

Stems procumbent; leaflets broad, suborbicular .... 1. *C. lemmoni.*
Stems suberect or twining; leaflets usually narrow, linear to lanceolate.
  Leaflets lanceolate .... 2. *C. pallida.*
  Leaflets linear.
    Leaflets glabrous above, pods straight, elongated .... 3. *C. longifolia.*
    Leaflets hairy above; pods falcate .... 4. *C. confusa.*

From Central America have been reported *Cologania pulchella* and *C. procumbens.* The former species is to be excluded from that region, but I here add *C. pallida* and *C. rufescens*, and there are probably still others to be found there.

C. procumbens, *C. ovalifolia*, and *C. australis* have been described from South American specimens. *C. procumbens* seems to extend into southern Mexico; *C. ovalifolia* has been credited to Mexico by several writers, but is probably to be excluded.

Only a few species have ever been in cultivation and these usually in botanic gardens. Bailey does not include the genus in the Cyclopedia of American Horticulture, while Nicholson only enumerates four in his Dictionary of Gardening. The most ornamental ones, such as *grandiflora*, *hirta*, *capitata*, etc., have never been cultivated, although they seem worthy of a trial. The species are all perennial, growing at considerable elevations, in dry situations and usually in the open.

The following are the species which have been reported in cultivation, with the year of their introduction:

Cologania biloba, 1827.
Cologania broussonetii, 1813, 1827.
Cologania pulchella, 1837.
Cologania angustifolia, 1827.

The following key is intended as merely suggestive and will probably require much modification when more material is brought to light.

KEY TO THE NORTH AMERICAN SPECIES.

Leaflets one.
  Corolla 2 cm. or more long .... 1. *C. procumbens.*
  Corolla less than 2 cm. long .... 2. *C. erecta.*
Leaflets, more than one, usually three.
  Leaflets linear to narrowly oblong.
    Leaflets glabrous or nearly so above.
      Pubescence on calyx appressed; pods 3 cm. or less long .... 3. *C. intermedia.*
      Pubescence on calyx spreading; pods 5 cm. or more long, narrower than the last.
      4. *C. longifolia.*
  Leaflets pubescent above
    Leaflets green .... 5. *C. angustifolia.*
    Leaflets very pale .... 6. *C. confusa.*

Leaflets oblong.
Flowers axillary, solitary or in pairs.
Stems climbing.
Leaflets green above.
Leaflets thickish.
Flowers in small umbels .... 7. *C. deamii.*
Flowers in pairs.
Hairs on calyx appressed .... 8. *C. scandens.*
Hairs on calyx spreading .... 9. *C. rufescens.*
Leaflets thin .... 10. *C. glabrior.*
Leaflets pale on both sides.
Leaflets rounded at apex .... 11. *C. jaliscana.*
Leaflets acute .... 12. *C. pallida.*
Stems not climbing.
Leaflets glabrous or nearly so above.
Petioles slender, sometimes 4 cm. long .... 13. *C. martia.*
Petioles very short or wanting.
Leaflets reticulate above, and with close appressed pubescence beneath. 14. *C. pringlei.*
Leaflets not reticulated above, and with somewhat spreading hairs beneath. 15. *C. houghii.*
Leaflets pubescent above.
Petioles short or wanting.
Pods short, turgid .... 16. *C. lemmoni.*
Pods elongated, narrow .... { 17. *C. humifusa.* 18. *C. obovata.*
Petioles elongated .... 19. *C. humilis.*
Flowers racemose or capitate.
Flowers racemose.
Racemes elongated.
Leaflets elliptical, strongly reticulated above; bractlets minute ... 20. *C. nelsoni.*
Leaflets ovate, not strongly reticulated above; bractlets linear.
Pubescence on pods and calyx appressed .... 21. *C. racemosa.*
Pubescence on pods and calyx spreading .... 22. *C. biloba.*
Racemes short .... 23. *C. grandiflora.*
Flowers capitate.
Leaves narrow, acute; flowers many .... 24. *C. capitata.*
Leaves broad and obtuse; flowers few .... 25. *C. hirta.*

1. **Cologania procumbens** Kunth, Mimos. 205. *pl. 57.* 1819.

Type locality: "Prope Popoyan, alt. 912 hex," South America.

Without seeing the type it is difficult to decide whether the Mexican material is to be referred to *C. procumbens* or not. For the present, at least, it seems better not to make any change. The character of reflexed hairs on the stems seems variable in the Mexican material, for the writer collected both forms on San Felipe in 1899. The flowers are usually in pairs, but the earlier plants sometimes produce umbels of 3 or 4 flowers.

Specimens examined:

Guatemala: Station not given, Enrique Th. Heyde, 1892 (nos. 131 and 582); from Santa Rosa, H. von Turckheim 1888 (no. 1419); from Department of Guatemala, W. C. Shannon (no. 4705), all in John Donnell Smith's distributions, in which the last two were sent out as *Galactia marginalis*, determ. Micheli.

Oaxaca. Between Guichocovi and Lagunas, altitude 187 to 289 meters, E. W. Nelson, June 27, 1896 (no. 2750); San Felipe, J. N. Rose, June, 1899 (no. 4596).

2. **Cologania erecta** Rose, Contr. Nat. Herb. **5**: 136. 1897.

Stems from a woody base, erect, 7.5 to 15 cm. high, with rather close, erect pubescence; leaflets elongated, 10 to 15 cm. long, 4 to 8 mm. wide, rounded at base, somewhat tapering toward apex, but with obtuse apiculate tip; calyx 4 mm. long; pod 2.5 to 3.7 cm. long, 3 mm. wide, pubescent.

Type locality: "Near Guadalajara."

Collected by Mr. C. G. Pringle on rocky hills near Guadalajara, June 21, 1893 (no. 4401).

3. **Cologania intermedia** H. B. K. Nov. Gen. & Sp. **6**: 414. 1823.

Type locality: "Prope Real del Monte, Mexicanorum;" collected by Humboldt & Bonpland.

Specimens examined:

Federal District: Valley of Mexico near Tizapan, Bourgeau, 1865–66 (no. 328); same locality, C. G. Pringle, August, 1897 (no. 7480); near Tlalpam, J. N. Rose, June, 1899 (no. 4530); Santa Fé, May 24, 1899 (no. 4321); same locality, July 11, 1901 (no. 5359).

Jalisco: Road between Mesquitec and Monte Escobado, August, 1894 (no. 2610).

Very near to *C. angustifolia*, to which Mr. Hemsley referred Bourgeau's plant, but with the upper surface of the leaves glabrous.

4. **Cologania longifolia** Gray, Pl. Wright. **2**: 35. 1853.

Type locality: "Hills near the copper mines, New Mexico. . . . Mountain ravines, on the Sonvita, near Deserted Rancho, Sonora."

5. **Cologania angustifolia** Kunth, Mimos. 209. *pl. 58.* 1819.

Type locality: "Prope La Magdalena," between Real del Moran and Actopan, Hidalgo; type collected by Humboldt & Bonpland.

Described in part as follows: Stems climbing; leaflets 3, linear, obtuse, on both sides, strigose; calyx hispid-pilose.

Specimens of the writer's referred here have the leaflets sometimes 10 cm. long and 5 mm. broad, the calyx covered with upwardly turned appressed hairs, the upper lobe of the calyx varying from acute to retuse, and the pods somewhat falcate. They may, however, represent a different species.

Collected bv J. N. Rose in foothills of the Sierra Madre, near Colomas, State of Sinaloa, July 14, 1897 (no. 1653); on Sierra Madre west of Bolaños, State of Jalisco, September 16, 1897 (no. 3720), and in State of Durango, August 13, 1897.

6. **Cologania confusa** Rose, sp. nov.

Low plant with slender stems either trailing or climbing; leaflets 3, linear, pubescent on both sides; calyx tube 6 mm. long, with spreading pubescence; pod falcate, about 3 cm. long.

Collected first by C. Wright in 1851 probably from near El Paso, Texas (no. 958, type), and more recently by Mr. G. C. Nealey in western Texas (no. 591a).

This species was taken for *C. angustifolia* Kunth by Dr. Gray and was reported by him in Plantæ Wrightianæ under this name, by which it has ever since gone. It differs from *C. angustifolia*, however, in its range, in its smaller flowers, and in the pubescence of the calyx. Dr. Gray states that he had not seen Kunth's illustration and description.

7. **Cologania deamii** Fernald, Proc. Am. Acad. **36**: 492. 1901.

Stems low and twining, pubescence reflexed; leaflets 3, broadly oblong, 2 to 3 cm. long, 1.2 to 1.5 cm. broad, apiculate, when young densely reddish-pubescent on both sides, the pubescence more scattered and appressed in age; flowers (at least the earlier ones) in umbels of two or four on peduncles sometimes 3 cm. long; pedicels 1 to 1.5 cm. long; bractlets filiform, usually borne some distance below the flowers;

calyx 5 to 7 mm. long with pubescence of spreading hairs; upper lobe retuse; corolla 2 cm. long, purplish; pods (immature) linear, 4 cm. long, pubescent.

Type locality: "Cuernavaca," Morelos.

Specimens examined:

Morelos: Near Cuernavaca, J. N. Rose, May 27 to 30, 1899 (no. 4360), and Charles C. Deam, July 7, 1901 (no. 40, type).

8. **Cologania scandens** Rose, sp. nov.

Stems climbing, pubescent; leaflets ovate, 3 to 8 cm. long, rounded at base, acute or obtuse and mucronate, appressed-pubescent on both sides, strongly nerved; perfect flowers in pairs; calyx tube about 6 mm. long clothed with whitish appressed hairs; flowers violet.

Collected by J. N. Rose on the road between Colotlan and Plateado, August 31, 1897 (no. 3613, type), and near Huejuquilla, August 25 (no. 3781). Perhaps nearest *C. pulchella*, but with rougher pubescence on the leaves, different pubescence on the calyx, etc.

9. **Cologania rufescens** Rose, sp. nov.

A slender climbing vine, covered with reddish and somewhat spreading hairs; leaflets 3, ovate, acute and apiculate or shortly acuminate, appressed brownish pubescent on both sides; calyx tube 10 mm. long, covered with spreading reddish hairs; lobes much as in *C. glabrior;* fruit not seen.

Collected by Heyde & Lux in Chiul, Department of Quiché, Guatemala, September, 1890, and distributed by John Donnell Smith (no. 4460).

This species was distributed as a variety of *C. pulchella* under a hitherto unpublished name, which is here adopted. It seems very distinct from true *pulchella.*

10. **Cologania glabrior** Rose, sp. nov.

Slender climbing vine; leaflets 2 to 6 cm. long, 1 to 4 mm. broad, ovate to oblong, very thin, greener and only slightly pubescent above, paler and appressed pubescent beneath, acute or sometimes obtuse at apex, rounded at base; flowers axillary, in pairs; buds long-acuminate; calyx tube 7 to 8 mm. long, covered with rather scanty appressed hairs; lateral lobes ovate and acuminate; dorsal lobe broader and acute; lower lobe linear.

Collected by Heyde & Lux, Lagrena de Ayarza, Department of Jalapa, Guatemala, September, 1892, and distributed by John Donnell Smith (no. 3743); perhaps from the same locality, Heyde, 1892 (no. 454, type).

Mr. Smith's specimen was labeled by Micheli with the trivial name adopted above, but simply as a form of *pulchella.* It must, however, be very different from that species, which comes from central Mexico.

11. **Cologania jaliscana** Wats. Proc. Am. Acad. **26**: 136. 1891.

C. pringlei Wats. Proc. Am. Acad. **25**: 147. 1890, not **23**: 271. 1888.

Type locality: Near Guadalajara "Jalisco;" type collected by Mr. C. G. Pringle (no. 2788).

12. **Cologania pallida** Rose, sp. nov.

Stems slender, climbing, pubescent; leaflets oblong to elliptical, usually acute, always apiculate, 2 to 3 cm. long, very pale and cinereous-pubescent on both sides; flowers solitary (in specimens seen) on slender peduncles 6 to 8 mm. long; bractlets subtending the calyx filiform; calyx tube 6 mm. long, with pubescence somewhat scattered, spreading and stiff; fruit not seen.

Collected by C. Wright in New Mexico in 1851 (no. 957, type) and by G. R. Vasey in the Organ Mountains of New Mexico in 1891. This plant was called *C. pulchella* by Dr. Gray, under which name it has since gone. Dr. Gray, however, seems to have been uncertain of its status, in one place stating that it perhaps was a different species and elsewhere that it was only a variety.

True *C. pulchella* is still very uncertain, a multitude of forms from a wide range of country having been referred to it, but it must be quite distinct from the above. According to the description it differs both in the color and the shape of the leaflets.

13. **Cologania martia** Wats. Proc. Am. Acad. **17**: 345. 1882.

Type locality: "Sandy places about San Luis Potosi."

Collected by J. N. Rose near Plateado, in the State of Zacatecas, September 3, 1897 (no. 2760).

Only collected in fruit and with fruits produced from imperfect flowers.

14. **Cologania pringlei** Wats. Proc. Am. Acad. **23**: 271. 1888.

Type locality: "On pine plains at the base of the Sierra Madre, Chihuahua."

15. **Cologania houghii** Rose, sp. nov.

A rather coarse trailing vine; branches densely covered with rough spreading hairs; leaves on very short petioles; leaflets 3, shortly oblong or nearly orbicular, 1.5 to 2.5 cm. long, rounded at apex, but often with a short mucro, becoming glabrate and shining above, appressed-pubescent beneath, densely ciliate; flowers usually in pairs, on peduncles 2 to 3 cm. long; bractlets linear, attached some distance below the calyx; calyx broadly tubular, 1.5 cm. long; pubescent with rather scanty spreading hairs; lower lobe linear; lateral ones ovate, acute; upper one very broad and obtuse; pods not seen.

Collected by J. N. Rose and Walter Hough along railroad between Tepeaca and Santa Rosa in the State and south of the city of Puebla, June 27, 1899 (no. 4737).

Resembling somewhat *C. humifusa*, but with different flowers, more glabrous leaflets, etc. This species is named for my friend, Dr. Walter Hough, who accompanied me on my second Mexican journey.

16. **Cologania lemmoni** Gray, Proc. Am. Acad. **19**: 74. 1883.

Type locality: "Arizona, on the high mesas of the Chiricahui Mountains, 1881, and the Huachuca, 1882;" collected by Lemmon.

The flowers of this species are still unknown, and only the pods produced from imperfect flowers have been collected. The following Mexican specimens have recently come to hand:

Chihuahua: Between Colonia Garcia and Platts Ranch, below Pacheco, E. W. Nelson, August, 1899 (no. 6269).

Durango: On road between San Julian and Cerro Prieto, September, 1898 (no. 4944).

17. **Cologania humifusa** Hemsl. Diag. Pl. Nov. **3**: 47. 1880.

Cologania humifusa is based upon three collections from widely different parts of Mexico. The first one mentioned, Parry & Palmer's no. 194, would naturally be taken as the type. Unfortunately, however, this number seems to cover two species. The one which I would designate as the type, supposing the Kew specimen agrees with mine, is that with elongated pods and leaflets hairy on both sides.

The second specimen mentioned, Coulter's, of Real del Monte, might well be *C. obovata* from the same locality. The third specimen, from the Valley of Mexico, I have left in *humifusa*, although it differs somewhat in pubescence on the pods, etc.

Type locality: "Mexico: in regione San Luis Potosi, alt. 6,000–8,000 ped. . . . ; Real del Monte . . . ; in convalle Mexici."

Specimens examined:

San Luis Potosi: Near San Luis Potosi, Parry & Palmer, 1878 (no. 194 in part). Coulter; Bourgeau (no. 330).

Federal District: Above Santa Fé, C. G. Pringle, September, 1889 (no. 8270); near same locality, J. N. Rose, July 11, 1901 (no. 5358).

Mexico: Near San Maria, J. N. Rose, July 12 and 13, 1901 (No. 5462).

18. **Cologania obovata** Schlecht. Linnæa **12**: 287. 1838.

This species was collected by C. Ehrenberg at "Mineral del Monte," perhaps better "Real del Monte."

Mr. Hemsley thinks this must be a variety of *C. pulchella*, but it is described as procumbent. I have seen no specimens.

This species should be compared with *C. humifusa* Hemsl.

19. **Cologania humilis** Rose, sp. nov.

Delicate herbs, somewhat branching at base, nearly erect, 8 to 12 cm. high, retrorsely pubescent; petioles 2 to 3.5 cm. long, usually longer than the leaflets; leaflets 3, elliptical to linear-oblong, obtuse or acute, appressed-pubescent on both sides, paler below, more or less articulated; calyx tube 6 mm. long, appressed-pubescent; corolla violet, 2 cm. long; pods not seen.

Collected by J. N. Rose, high up on the Sierra Madre, near Santa Gertrudis, August 7, 1897 (nos. 2042, type, and 3426).

20. **Cologania nelsoni** Rose, sp. nov.

A climbing vine, 9 to 24 dm. long, with scattered appressed pubescence; leaflets 3, elliptical, acute, 2.5 to 5 cm. long, above somewhat shining and strongly reticulated, beneath pale and reticulated, with scattered appressed hairs on both surfaces; racemes axillary, elongated, longer than the petioles, bearing 3 to 5 pairs of flowers; pedicels 8 mm. long; bractlets at base of flower short, minute; calyx tube 8 to 10 mm. long, bearing scattered appressed hairs; lower lobe lanceolate, acuminate; lateral lobes broadly ovate, acute; upper lobe obtuse; corolla pale violet, 2.5 to 2.8 cm. long; fruit not seen.

Collected by E. W. Nelson in mountains about Yalalag, Oaxaca, altitude 1,800 meters, August 1, 1894 (no. 976).

This species differs from *C. racemosa* in the thickness, venation, and shape of leaflets, the shape of the calyx lobes, larger flowers, etc.

21. **Cologania racemosa** (Robinson) Rose.

C. pulchella racemosa Robinson, Proc. Am. Acad. **29**: 315. 1894.

A climbing vine with pubescence dense and reflexed, but not closely appressed; leaflets 3, broadly ovate, 2 to 5 cm. long, 1.5 to 4 cm. broad, generally acute, but sometimes obtuse or even retuse, pubescent on both surfaces, not strongly reticulated above, green, paler beneath and somewhat reticulated; imperfect flowers (fertile) in pairs in the lower axils, nearly sessile; pods linear, flat, 3 cm. long; perfect flowers numerous, borne in elongated racemes 10 to 15 cm. long; buds acuminate; calyx, 5 to 6 mm. long; lobes narrow; corolla dark purple, 18 to 20 mm. long; fruit not seen.

Type locality: The variety was based upon two collections, Dr. E. Palmer's no. 379 "Tequila," and Mr. Pringle's no. 5164 "Guadalajara."

Specimens examined:

Jalisco: Only Palmer's and Pringle's plants referred to in original description, of which duplicates are in the National Herbarium.

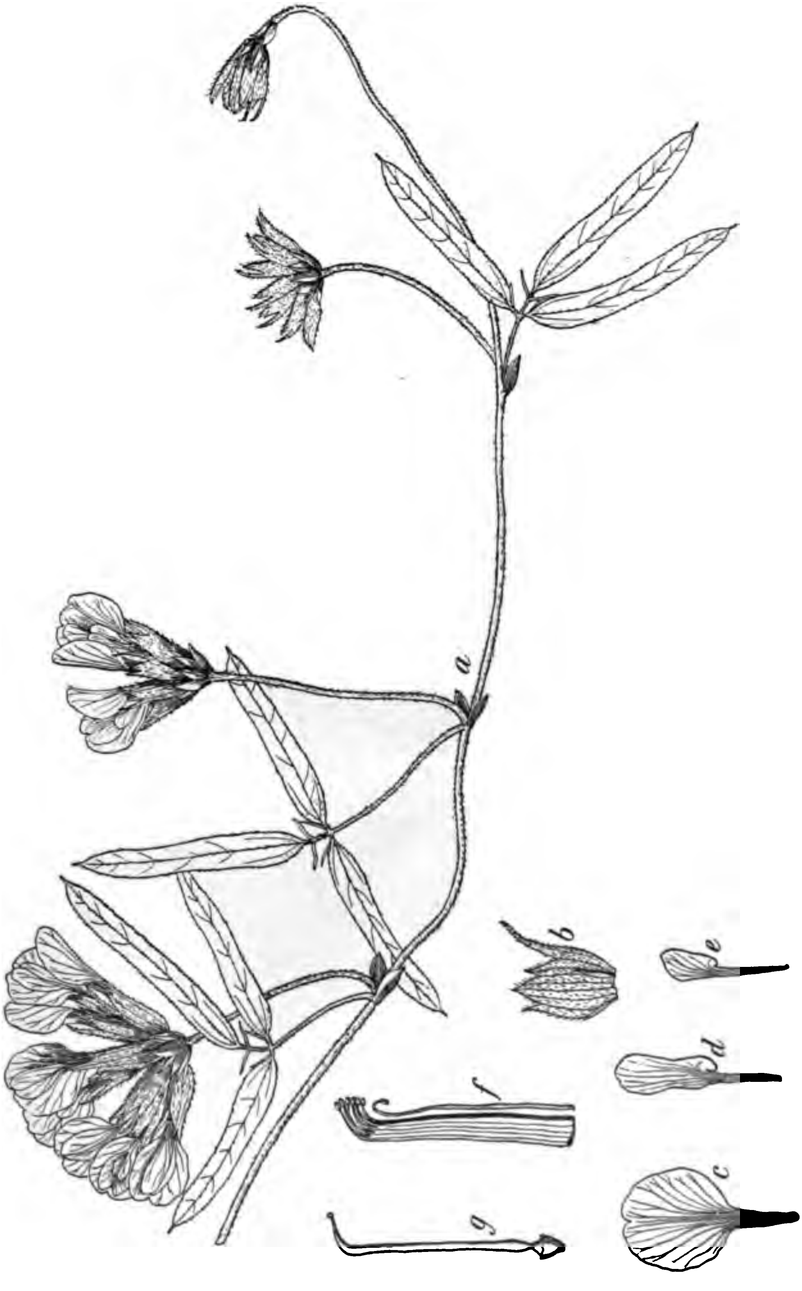
This form seems specifically distinct from *C. pulchella*. It differs in having its perfect flowers borne in elongated axillary racemes, in the size of the leaves, in the pubescence of the calyx, etc.

22. **Cologania biloba** (Lindl.) Nicholson, Dict. Gard. **1**: 363. 1884–1889.

Glycine biloba Lindl. Bot. Reg. **17**: *pl. 1418.* 1831.

This species was described from specimens which flowered in England in 1830. The seed is said to have been brought from Mexico by Mr. George Ackermann in 1827.

We have no named specimens of this species. Pringle's no. 6432, from the Pedregal, near the City of Mexico, must be near it. Bourgeau's no. 774, also from the Pedregal, belongs with Mr. Pringle's plant. The latter was referred by Mr. Hemsley to *C. pulchella*.



COLOGANIA CAPITATA ROSE.

Robinson's *C. pulchella racemosa* has a similar inflorescence, but different pubescence.

23. **Cologania grandiflora** Rose, sp. nov.

Stems tall, climbing, retrorsely hairy; leaflets 3, ovate-oblong, large, 6 to 8 cm. long, 3 to 3.5 cm. wide, rounded or truncate at base, rounded at apex, apiculate, appressed-pubescent on both sides, paler beneath; petioles and petiolules reddish-pubescent, the former elongated and 4 to 6 cm. long; flowers 4 to 10, in a compact raceme, shorter than the petioles; calyx 9 to 10 mm. long, pale appressed-pubescent; lower lobe of sepal longer than the others; corolla purple, 2.5 cm. long; fruit not seen.

Collected by C. G. Pringle, Federal District, Valley of Mexico, August, 1896 (no. 7264).

Very near to this species are two specimens of Lucius C. Smith's from the State of Oaxaca (nos. 97 and 98).

This species resembles what I have called *C. biloba* in its foliage, but is very different in its pubescence.

24. **Cologania capitata** Rose, sp. nov. PLATE V.

A slender vine; leaves small; petioles about equal to the leaflets; stipules ovate-oblong, obtuse, 5 mm. long; leaflets 3, linear to linear-oblong, appressed-pubescent on both sides, paler beneath, 2 to 3.5 cm. long, rounded at apex, mucronate; flowers in a compact head surrounded by an involucre of bracts on an elongated peduncle as long as to much longer than the petioles; calyx purplish with scattered brownish hairs, the tube 8 mm. long; corolla purplish.

Collected by J. N. Rose near the top of the Sierra Madre, near Santa Teresa, August 13 (no. 3459, type) and August 9 (no. 2445).

EXPLANATION OF PLATE V.—Fig. *a*, plant; *b*, calyx; *c*, banner; *d*, wing; *e*, keel; *f*, stamens; *g*, style. Figs. *a–e*, natural size; *f* and *g*, scale of 2.

26. **Cologania hirta** (Mart. & Gal.) Rose, Contr. Nat. Herb. **3**: 315. 1895.

Galactia hirta Mart. & Gal. Bull. Acad. Brux. **10**^{2}: 190. 1843.

Type locality: "Cerro de San Felipe," Oaxaca; type collected by Galeotti (no. 3204).

Twining 12 dm. high.

Re-collected by C. G. Pringle under oaks, Sierra de San Felipe, Oaxaca, altitude 2,400 meters, August 13, 1894 (no. 4793).

DOUBTFUL, UNCERTAIN, OR EXCLUDED SPECIES.

Galactia purpurea Mart. & Gal. Bull. Acad. Brux. **10**^{2}: 191. 1843.

Type locality: "Dans les bois de Regla, près de Real del Monte, à 600 pieds." Collected by Galeotti (no. 3346).

This is referred to *C. pulchella* by Mr. Hemsley. The inflorescence is racemose.

To *C. pulchella* Mr. Hemsley also refers Ehrenberg's plant, likewise from Regla and Mineral del Monte. Ehrenberg's plant from this station was referred by Schlechtendal to the South American species *C. ovalifolia*.

Cologania broussonetii (Balb.) DC. Prod. **2**: 237. 1825.

Clitoria broussonetii Balbis, Cat. Taur. 26. 1813.

This species was described from cultivated specimens. I do not know it.

De Candolle says the native country is unknown, but the Kew Index refers it to Mexico.

Cologania pulchella H. B. K. Nov. Gen. & Sp. **6**: 413. 1823.

Type locality: "Prope Pa[t]zcuaro," Michoacan; type collected by Humboldt and Bonpland.

Although more material in herbaria has been referred to this species than to any other, I have not yet seen any specimens which I am disposed to refer to it. Some Mexican collector should visit the type locality, which can now be easily reached, and obtain a supply of material.

Cologania? affinis Mart. & Gal. Bull. Acad. Brux. **10**^{2}: 188. 1843.

Collected by Galeotti (no. 3283) in oak woods near "Mirador." Not since reported.

Described as climbing; retrorsely villous; leaflets ovate, obtuse, appressed-pubescent, glaucescent beneath; flowers axillary, some fasciculate; calyx pilose.

See Seaton's no. 326 and Pringle's no. 8603.

Cologania ovalifolia H. B. K. Nov. Gen. & Sp. **6**: 412 (royal ed. 233). 1823.

This is a South American species which was identified with a Mexican plant by Schlechtendal[a] but should probably be excluded from the Mexican flora.

Martia mexicana Zucc. Abhandl. Akad. Muench. 1: 339. *pls. 14, 15.* 1832.

Type locality: "In imperii Mexicani regionibus calidioribus;" type collected by D. Keerl.

I have not been able to make out this species. It resembles very much Watson's *C. martia*, as well as specimens from the valley of Mexico which I have referred to *C. intermedia.*

LIST OF THE SPECIES OF HARPALYCE WITH TWO NEW DESCRIPTIONS.

The genus Harpalyce is very similar in foliage, habit, and pods to Brongniartia and the only reason that it is not more frequently misnamed in herbaria is that it has not often been collected. It is readily distinguished, however, by its having a remarkable two-lipped calyx, while Brongniartia has a nearly regular calyx. It can also be readily distinguished from Brongniartia without flowers by the leaflets which are thickly set with pellucid dots.

In publishing the two new species below I have taken occasion to list with them all the known, I might better say the little-known, Mexican species with the hope that Mexican collectors may furnish us with more material.

Harpalyce mexicana Rose, sp. nov.

A small tree; bark of old wood smooth, densely covered with small pale lenticels; young wood covered with a dense white pubescence; rachis very pubescent; leaflets 11 to 15, oblong, 3 to 6 cm. long, rounded at base, obtuse, apiculate, in age nearly smooth, beneath somewhat pubescent, thickish and reticulated; fruit oblong, 5 to 6 cm. long.

Collected by J. N. Rose, west of Bolaños, September 15 to 17, 1897 (no. 2944).

Harpalyce pringlei Rose, sp. nov.

A low shrub 3 to 18 dm. high; all parts very pubescent when young; leaves 1 to 2 dm. long; stipules minute, caducous; leaflets 7 to 11, oblong, 2 to 4 cm. long, 15 to 20 mm. broad, rounded at base, retuse, thickish, strongly veined, above nearly glabrate, beneath quite pubescent when young, becoming glabrate in age, with pellucid dots as in the genus; flowers in dense short clusters; sepals densely reddish-pubescent; petals bluish; legume glabrous, oblong, 8 cm. long, 2 to 2.5 cm. broad.

Collected by C. G. Pringle on the sides of a barranca above Cuernavaca, Morelos, 1898 (no. 6827, type), and at the same station by J. N. Rose, May, 1899 (no. 4392).

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[a] Linnæa **6**: 286.

Harpalyce arborescens Gray, Proc. Am. Acad. 5: 178. 1861.

The type was based on Ervenberg's no. 18 from "near Tantoyuca," in northern Vera Cruz. Here, also, Dr. Gray referred T. Coulter's no. 556 from Zimapan, but it is doubtless to be placed elsewhere.

Leaflets 3 or 4 pairs, oblong, 3 to 5 cm. long, obtuse or hardly retuse, in age nearly glabrous above; calyx densely reddish-pubescent. Type in herb. Gray.

Harpalyce formosa DC. Prod. 2: 523. 1825.

The type of the genus. A Mexican species, only known from the tracings of Mociño & Sessé.

Harpalyce hidalgensis Taub. Bull. Herb. Bois. 3: 613. 1895.

The type was collected by Seler (no. 658) in the State of "Hidalgo, prope Huejutla."

The type locality of this species is very near that of *H. arborescens* Gray, with which it should be very carefully compared.

The plant of Coulter's referred to *H. arborescens* may belong here. The leaflets are 6 pairs.

Harpalyce loeseneriana Taub. Bull. Herb. Bois. 3: 612. 1895.

The type of this species came from "prope Mitla," State of Oaxaca, and was collected by Seler (no. 59).

Perhaps here should be placed Lucius C. Smith's no. 45.

Harpalyce retusa (Benth.) Rose.

Brongniartia retusa Benth. in Hemsl. Diag. Pl. Nov. 1: 8. 1878.

Fruit 4 cm. long, 18 mm. broad above the middle, cuneate at base; leaves thinner and pubescence of calyx whiter than in *H. arborescens*.

The type locality of this species was said to be "Tula," but there are three places in Mexico of this name, one in the State of Oaxaca, another in Hidalgo, and a third in Tamaulipas. It undoubtedly came from the latter State. The two numbers (nos. 759 and 2179) cited by Hemsley are in the Gray Herbarium, and the labels state that the plants were collected by Berlandier between Tula and Tampico, therefore in the State of Tamaulipas. Here Pringle collected his no. 7286 (1896), which agrees with these type sheets of *B. retusa*.

CLIMACORACHIS, A NEW GENUS.

Climacorachis Hemsl. & Rose, gen. nov.

Calyx strongly 2-parted; banner orbicular; keel considerably shorter than the wings, obtuse; stamens in 2 clusters of 5 each; ovary stipitate; pod oblong, obtuse, 2 to 4 seeded, not at all jointed or constricted between the seeds, probably dehiscent.

Low, wiry shrubs, with pinnate leaves, numerous small leaflets, peltate, striate stipules, and inflorescence consisting of a short zigzag, striate-bracted raceme. Flowers yellow, bibracteate at base.

Inflorescence and foliage resembling Aeschynomene, but the pods very different. It should probably be placed between that genus and Herminiera.

Native of the mountains of western Mexico.

Type species, *C. mexicana*.

Climacorachis mexicana, Hemsl. & Rose, sp. nov.

Much branched, 2 to 4 dm. high, glabrous throughout except in the inflorescence; branches slender and wiry; leaflets 9 to 12 pairs, linear, 4 to 5 mm. long, strongly 3-nerved below, mucronately tipped; inflorescence 2 to 4 flowered; pubescence on rachis, bracts, bractlets, pedicel, and calyx more or less setose, consisting of long yellowish hairs, with shorter, perhaps viscid, hairs intermixed; bractlets ovate, acute, 2 mm. long;

calyx 5 mm. long; the upper lobe broad, rounded at apex; corolla yellow, streaked with purple; pods 5 to 10 mm. long, 2 to 4 seeded.

Collected by J. N. Rose in the Sierra Madre west of Bolaños, State of Jalisco, September 15 to 17, 1897 (no. 2972).

Climacoràchis fruticosa Hemsl. & Rose, sp. nov.

Taller and more frutescent than the last; branches as well as rachis of leaf and inflorescence pilose and with shorter glandular hairs; leaflets usually more numerous than in the last, sometimes 20 pairs, 7 mm. long, the venation not so strong and more frequently 4-nerved; stipules (not seen) caducous or deciduous; inflorescence strongly zigzag, about 12-flowered; bracts, bractlets, and calyx glabrous; ovary pubescent; pods not seen.

Similar to *C. mexicana* but more shrubby, with more numerous flowers, and with a different distribution of the pubescence.

Collected by E. W. Nelson on mountains near Talpa, Jalisco, altitude 1,320 to 1,500 meters, March 7, 1897 (no. 4038).

RAMIREZELLA, A NEW GENUS.

Ramirezella, gen. nov.

Calyx small, campanulate, colored; calyx teeth 5, about equal, short, obtuse or rounded. Corolla large and showy, purplish and white; standard orbicular with scale-like appendages at base; wings auriculate on the upper side; keel much elongated, at the base erect, but at the middle bent nearly to a right angle, and at the tip curved inward. Stamens 10, diadelphous. Style bearded near the end; stigma oblique. Pods straight, oblong in outline, turgid, dehiscing; seeds orbicular, embedded in a white spongy mass of cells.

Tall, twining woody vines. Leaves pinnate; leaflets 3. Inflorescence a dense axillary raceme, at first densely imbricated with large striate bracts; the bractlets at the base of the calyx small, ovate.

A very remarkable genus belonging to the Phaseoleae, the type species having been described as a Vigna. From this genus it is abundantly distinct in its habit, inflorescence, calyx, keel, fruit, etc. In this opinion Dr. B. L. Robinson, who described it as a new Vigna, acquiesces.

This genus is named for my friend, Dr. José Ramirez, of the Instituto Medico National de Mexico, who is one of the foremost men in natural history in that Republic, and who has done much to add to the pleasure and success of my various Mexican expeditions.

Four species are here described, *R. strobilophora* being the type.

Ramirezella strobilophora (Robinson) Rose.

Vigna strobilophora Robinson, Proc. Am. Acad. **27**: 167. 1892.

A twining, woody-stemmed vine 5 meters or more high, the young parts covered with a fine soft pubescence; leaflets ovate, acuminate, apiculate, about 8 cm. long by 3 to 4 cm. broad, slightly pubescent above, much paler and densely pubescent beneath; peduncles 7 to 9 cm. long; fully developed racemes 6 to 8 cm. long; pods glabrous, about 12 cm. long.

Collected by G. G. Pringle in a barranca near Guadalajara, September 12, 1891 (no. 5163), and also in August, 1893 (no. 4503).

Type locality: "Barranca near Guadalajara."

Some years ago this was figured in the Garden and Forest[a] and recommended as possessing cultural value. It was referred to as follows:

"*Vigna strobilophora*, Robinson, sp. nov. is a twining vine with a woody stem about an inch thick. It climbs into the tops of shrubs and low trees, and shows abundant flowers which rival in beauty those of the cultivated Wistaria. The flowers are purple and white and are borne in dense racemes 2 or 3 inches long."

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[a] April 18, 1894, p. 153; fig. 30, p. 155.

Ramirezella occidentalis Rose, sp. nov.

Resembling *R. strobilophora*, but leaves very broadly ovate, nearly glabrous on both sides, 10 cm. long, 7 to 8 cm. broad; inflorescence very slender, 3 to 4 dm. long, the flowers more numerous, somewhat smaller; pods 8 to 10 cm. long, glabrous.

Collected by Dr. Edward Palmer near Acapulco, Mexico, October, 1894, March, 1895 (no. 179).

Ramirezella pubescens Rose, sp. nov.

Resembling *R. strobilophora*, but with thicker, broader, more pubescent leaflets, the racemes stouter, calyx somewhat larger, its tube pubescent without, the ovary densely lanate, pods pubescent, etc.

Collected by E. W. Nelson on road between Tlapa and Tlaliscatilla, Guerrero, December 5, 1894 (no. 2046).

Ramirezella glabrata Rose, sp. nov.

A tall vine, stems glabrous or early glabrate; leaflets ovate, with slender acumination, 4 to 8 cm. long, very thin, nearly glabrous on both sides, hardly paler beneath; peduncles 6 to 15 cm. long; racemes becoming 12 to 15 cm. long; bracts glabrous except on the margins, simply acute, at least the lower ones; pods (immature) glabrous, with a long apiculation (10 to 15 mm. long).

Collected by J. N. Rose at Bolaños, Jalisco, August 25, 1897 (no. 2853, type), and on road between Huejuquilla and Mesquitec, Jalisco, August 25, 1897 (no. 2562).

Closely resembling *R. strobilophora*, but more glabrous throughout, with thinner leaflets and blunter bracts and with long apiculations to the pods.

A NEW SPECIES OF BRADBURYA WITH REVISION OF TWO NAMES.[a]

Before offering for publication the following description and new combinations much recent material and all the descriptions of the Mexican species of Bradburya have been passed in review several times. Upon them a synopsis of the Mexican species has been made, but it seems best for several reasons not to present it at this time. Our knowledge of the species is still meager, their number being manifestly greatly in excess of what has been supposed. Our commonest, or those supposed to be commonest, have not been well defined or restricted. For instance, *B. virginiana*, based upon plants from Virginia, has been reported from New Jersey southward throughout tropical America to Bolivia.

B. pubescens, based on material from a high mountain valley of central Mexico, has been assigned to many parts of tropical Mexico and South America.

Bradburya unifoliata Rose, sp. nov.

A delicate vine, 3 to 9 dm. long, glabrous or nearly so; leaflets single, linear to oblong or even orbicular, 2 to 9 cm. long, 3 to 12 mm. broad, obtuse, with or without a short apiculation, rounded at base, strongly reticulated on both sides; stipules ovate, striate; stipels linear; petioles 8 to 12 mm. long, usually 2-flowered; bracts broadly ovate, striate, acute, 5 mm. long; pedicels about 5 mm. long; calyx tube broad, 2 mm. high; dorsal lobe 2-parted nearly to the base, linear, 4 mm. long; the three ventral lobes narrow and longer than the dorsal ones; banner broad, 12 mm. long, "dull lilac," slightly pubescent without; pods linear, 5 to 6 cm. long including the long apiculation (1 cm. long), glabrous.

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[a] **Bradburya** Raf. Fl. Ludov. 104. 1817.
Centrosema Benth. Ann. Wien. Mus. **2**: 117. 1838.

Specimens examined:

Chiapas: Between San Richardo and Ocozucuantla, altitude 780 to 990 meters, E. W. Nelson, August 18, 1895 (no. 2977), and table-land about Ocuslapa, altitude 1,020 to 1,140 meters, E. W. Nelson, August 21, 1895 (no. 2996).

This species is very unlike any of the Mexican species heretofore described.

Bradburya sagittata (Humb. & Bonpl.) Rose.

Glycine sagittata Humb. & Bonpl. in Willd. Enum. Hort. Berol. 757. 1809.
Rudolphia dubia H. B. K. Nov. Gen. & Sp. **6**: 432. *pl. 591.* 1823.
Centrosema hastatum Benth. Ann. Wien. Mus. **2**: 120. 1838.
Centrosema dubium Hemsl. Biol. Centr. Am. **1**: 294. 1880.

Mexican specimens examined:

Colima: Near Manzanillo, Dr. Edward Palmer, March, 1891 (no. 1365).
Guerrero: Near Acapulco, Dr. Edward Palmer, 1894–95 (no. 620).

Bradburya schiedeana (Schlecht.) Rose.

Clitoria schiedeana Schlecht. Linnæa **12**: 284. 1838.

Type locality: "In dumetis pr. Jalapam" and "Hacienda de Laguna."

This species has heretofore been known only from the material collected by Schiede more than seventy-five years ago. In 1830 it was referred to Clitoria without specific name, but in 1838 it was named and described as *C. schiedeana*. Up to this time, however, Centrosema (now Bradburya) had been passing as a section of Clitoria. In August, 1901, the writer visited Jalapa, Mexico, the type locality of this species, where he found it growing in great abundance in the thickets and hedges in all directions from the town. It is a vigorous-growing vine, suggestive in its habit, foliage, and large flowers of Canavalia, one species of which is often associated with it.

Specimens examined:

Vera Cruz: Near Jalapa, J. N. Rose, August 13, 1901 (no. 6118).

NEW SPECIES OF SEVERAL GENERA.

Cracca submontana Rose, sp. nov.

Probably tall plant; branches densely reddish-pubescent; leaflets 6 to 8 pairs, oblong to lanceolate, 2 to 6 cm. long, acute, glabrous and somewhat shining above, densely reddish or silvery pubescent beneath; racemes axillary or terminal, elongated, 2 to 3 dm. long, many-flowered; calyx densely reddish-pubescent, the lower lobe linear, the lateral lobes shorter, ovate; banner very broad, 2.5 cm. long; young pods pubescent.

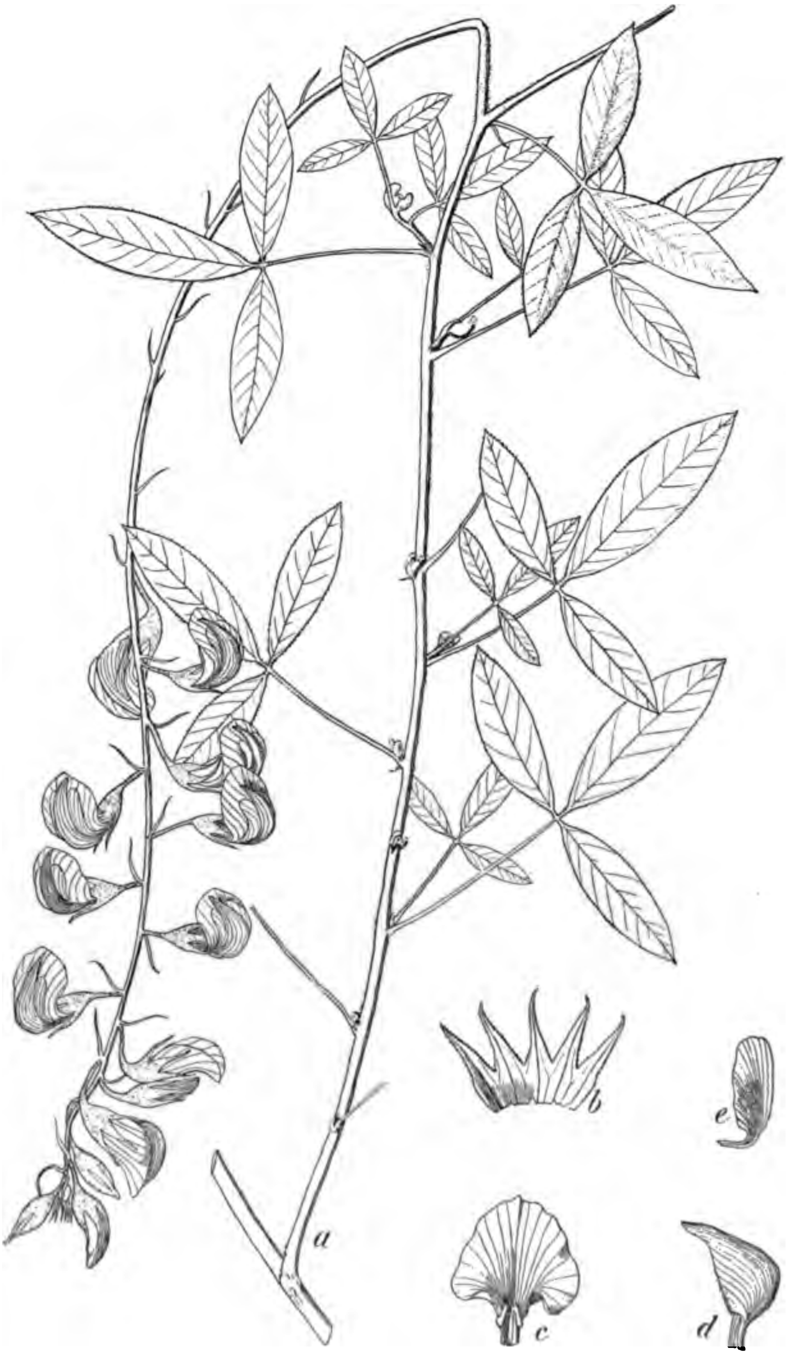
Collected by J. N. Rose between Pedro Paulo and San Blascito, Tepic, August 4, 1897 (no. 3336).

Crotalaria tenuissima Rose, sp. nov.

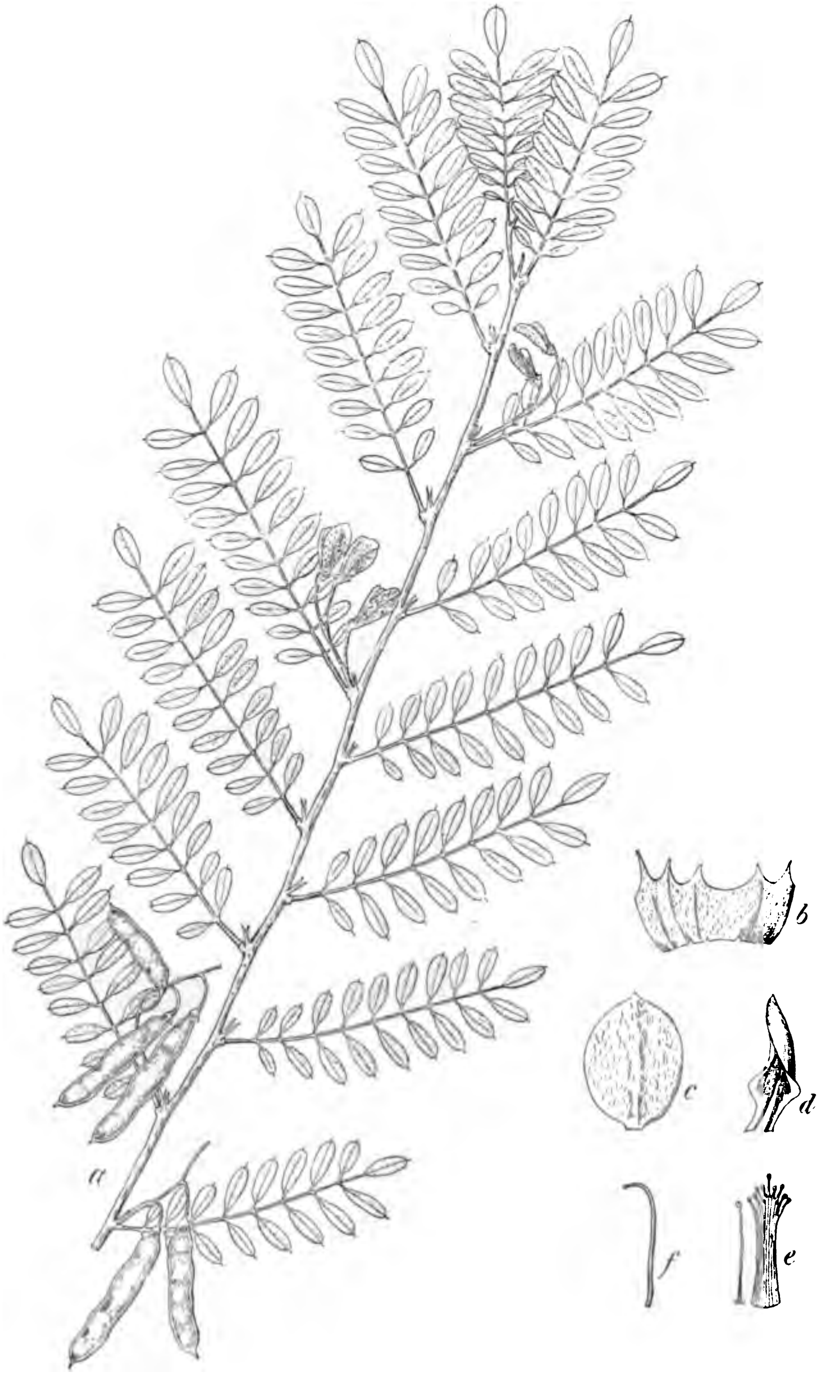
Perennials, much branched, 3 to 4 dm. high, somewhat pubescent; leaflets 3, very narrow, elongated, 3 to 10 cm. long, 3 to 5 mm. broad, pubescent beneath; stipules minute; racemes elongated, 2 cm. long, naked below; pedicels 6 mm. long; bractlets small, short; bractlets minute; calyx 8 mm. long, the lobes narrow and acute; banner 10 mm. long, broad; wings 5 mm. long, narrow; keel considerably exceeding the wings, strongly beaked; pods (immature) pubescent.

Collected by J. N. Rose between Pedro Paulo and San Blascito, Tepic, August 4, 1897 (no. 1981).

Very similar to *C. filifolia* in form of leaflets, but certainly a perennial, with larger and more numerous flowers, etc.

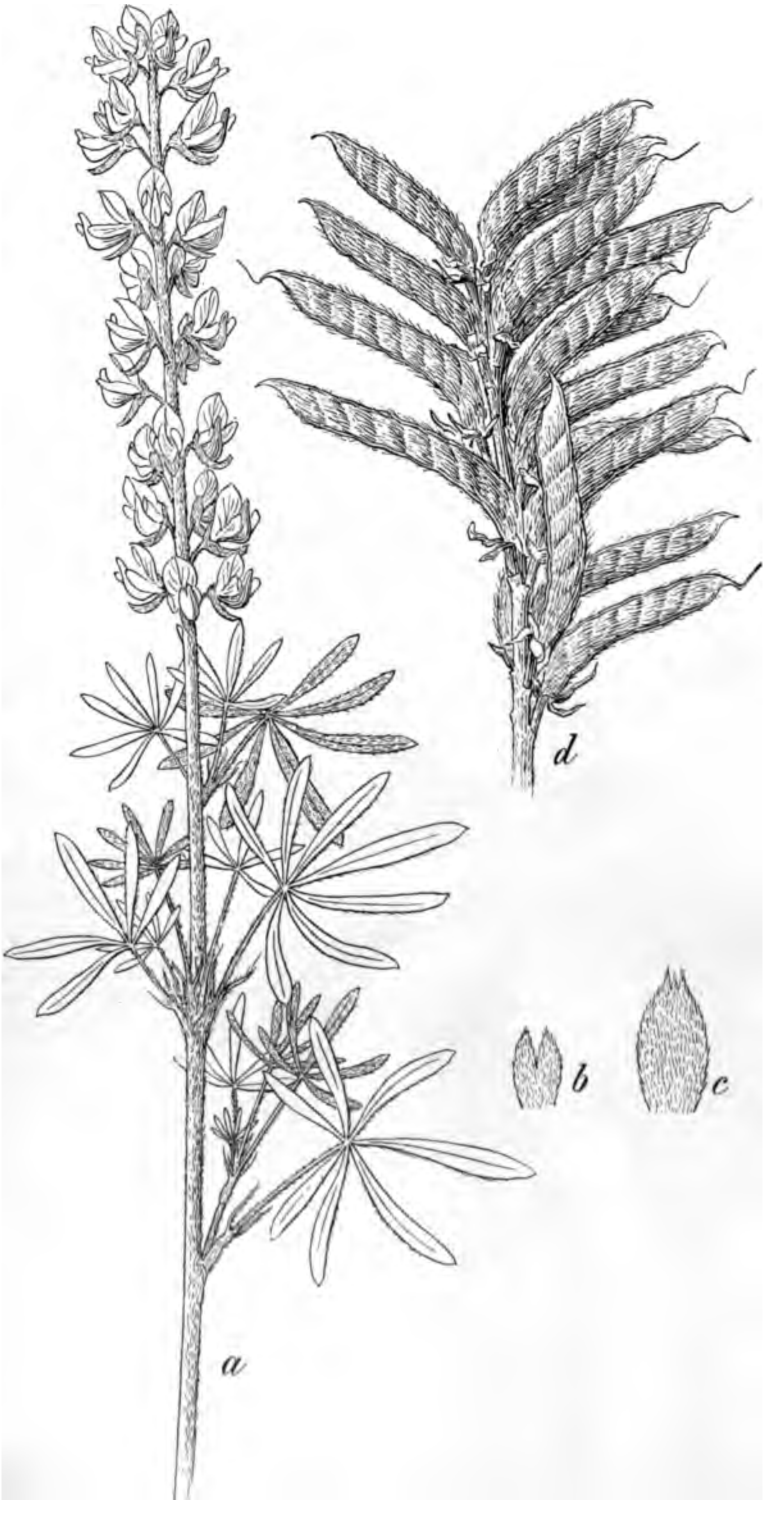


CROTALARIA VIMINALIS ROSE.



INDIGOFERA PLATYCARPA ROSE.

PLATE VIII.



Crotalaria viminalis Rose, sp. nov. PLATE VI.

A tall shrub, 1.8 to 3 meters high with long pendant branches giving the habit of a weeping willow, covered with white soft somewhat spreading pubescence; leaflets 3, oblong, rounded or somewhat narrowed at base, obtuse, glabrous or nearly so above, soft silky pubescent beneath, 2 to 4 cm. long; stipules minute; racemes elongated and hanging, 3 to 10 dm. long, naked toward the base, many-flowered; bracts subtending flowers linear; pedicels 5 to 6 mm. long; calyx 1 cm. long, the tube short, the lobes acuminate, silky; banner broad, about 15 mm. long; keel about 2 mm. long, bent at the middle nearly at right angles, ciliate on the upper and lower margins; wings much shorter; stamens glabrous; style slender, hairy below, glabrous near the middle, hairy on one side above; pods 3 cm. long, silky.

A common plant on the exposed lava beds near Cuernavaca, altitude 1,660 meters. The long pendent branches waving made it a most striking plant.

Collected by Mr. C. G. Pringle at Cuernavaca, September, 1896 (no. 6557), and same locality by J. N. Rose, May, 1899 (no. 4341, type).

The writer first took this species for the *C. eriocarpa* Bentham, but he has since collected, perhaps at the very type locality, the latter species. *C. eriocarpa* comes from a totally different floral zone, has short racemes and a yellowish pubescence, etc.

EXPLANATION OF PLATE VI.—Fig. *a*, branch; *b*, calyx; *c*, banner; *d*, keel; *e*, wing. Fig. *a*, scale of ⅓. *b*, *c*, *d* and *e*, natural size.

Indigofera platycarpa Rose, sp. nov. PLATE VII.

A shrub 3 to 5 m. high, much-branched; branches whitish-pubescent or in the younger parts reddish; leaflets mostly 17 to 21, opposite, petiolulate, oblong to obovate, rounded at base, rounded or retuse at apex and with a very decided apiculation, appressed-pubescent on both sides, 4 to 8 mm. long; racemes axillary, much shorter than the leaves, few-flowered; calyx very small (1 mm. high) cup-shaped; corolla 7 mm. long, rusty-pubescent; pod broad for the genus, flat, 2 to 3 cm. long, slightly pubescent; seeds few.

Collected by C. G. Pringle on mountains above Iguala, Guerrero, October 6, 1900 (no. 8399).

This species is characterized by its very broad pods.

EXPLANATION OF PLATE VII.—Fig. *a*, branch. *b*, calyx. *c*. banner; *d*, keel; *e*, stamens; *f*, style. Fig. *a*, natural size; *b*, scale of 4. *c*, *d*, *e*, and *f*, scale of 2.

Lupinus submontanus Rose, sp. nov. PLATE VIII.

Rather low plants, 3 to 6 dm. high, somewhat branching, glabrate below; leaflets 4 to 8, mostly 7 or 8, narrowly oblanceolate, 3 to 4 cm. long, obtuse, glabrous, slightly hairy beneath, longer than the slender petiole; stipules small, united for half their length to the petiole, free tips setaceous; bracts linear, 5 to 6 mm. long; flowers small, in a short (1 dm. long in type specimen) raceme, spike-like, pedicels 1 mm. long canescently pubescent as are also rachis and calyx; calyx 2-lipped; lower lip 5 mm. long, twice as long as upper, obtuse, perhaps sometimes 3-toothed; upper lip strongly 2-toothed; keel ciliate; fruit not seen.

Collected by C. G. Pringle on Mount Orizaba, August 26, 1901 (no. 8544), and by J. N. Rose and Robert Hay, same date and place (no. 5673, type).

This species is quite unlike any other known Mexican species. In the toothing of the lower lip it answers to the little known *L. mexicanus*, but in other respects differs. Of the three or four species which have been reported from Mount Orizaba it seems quite distinct. It might be suspected to be *L. glabratus* Mart. & Gal. from near the same station, but it certainly does not answer the description of that species.

EXPLANATION OF PLATE VIII.—Figs. *a* and *d*, flowering and fruiting branches; *b*, upper calyx lobe; *c*, lower calyx lobe. Figs *a* and *d*, natural size, *b* and *c* scale of 3.

Nissolia montana Rose, sp. nov.[a]

Stems climbing, puberulent; leaflets 5, orbicular to oblong, rounded at both ends, with slender apiculation, 2 to 4 cm. long, glabrous except in very young leaves; flowers numerous in the axils of the leaves, yellow or greenish; calyx glabrous, 3 to 4 mm. long, rather broad, glabrous without, green; tube truncate between the linear sepals (shorter than the tube); corolla pubescent without, 10 mm. long; immature pods acutish, pubescent.

Collected by C. G. Pringle on mountains near Iguala, Guerrero, October 24, 1900, (no. 9259).

This species is perhaps nearest *N. multiflora* Rose, but has different pubescence, larger and differently shaped leaflets, calyx, fruit, etc.

Phaseolus (Drepanosporon) oaxacanus Rose, sp. nov. PLATE IX.

A slender vine, glabrous or nearly so; stipules ovate, obtusish, striate; petioles slender; leaflets triangular, acute and apiculate, nearly truncate at base, thin, dark green above; petioles hairy; stipels acute; flowering peduncles 1.2 to 1.5 dm. long, much longer than the leaves; bracts ovate, acuminate and acute, either with a lateral tooth on either side or 3-lobed; flowering pedicels slender, 4 to 6 mm. long; bracts at base of calyx minute; calyx tube 2 mm. high, rather broad, glabrous or nearly so without; 3 lower lobes nearly equal, obtuse, small; upper lobe truncate; corolla purple (?), 6 mm. long.

Collected by Mr. C. G. Pringle on the Sierra de San Filipe, altitude 2,550 meters, August 24, 1894 (no. 5814 a).

EXPLANATION OF PLATE IX.—Fig. *a*, plant; *b*, calyx; *c*, banner; *d*, wing; *e*, keel; *f*, stamens; *g*, style. Fig. *a*, natural size; the others, scale of 2.

Phaseolus (Macroptilium) pedatus Rose sp. nov. PLATE X.

Stems 2 to 4 dm. long (?), from small oblong tubers (2 cm. long), slender and creeping, with spreading pubescence; leaflets 3, the lateral ones deeply parted, giving the leaf the appearance of having 5 linear leaflets, glabrous or with short appressed hairs above, the margins involute, midnerve prominent beneath and hairy; raceme including the peduncle filiform and elongated, 1 dm. or less long, few-flowered; flowers in pairs, subsessile; bractlets at base of calyx minute; sepals 5, nearly equal, ovate, acuminate, shorter than the calyx tube (1.5 mm. long), ciliate; corolla purplish; wings erect, much longer than the keel and banner, 8 to 9 mm. long, tapering at base into an elongated filiform claw; banner nearly obicular, 5 mm. in diameter; keel forming a single coil; free stamen thickened above the base; style flattened, hairy below the stigma; stigma capitate; disk at base of pistil toothed; ovary 1 or 2 ovuled; immature pods short, densely sericeous, 1 to 2 seeded.

Collected by C. G. Pringle, on damp sandy soil, Iguala, Guerrero, altitude 720 meters; October 25, 1900 (no. 8367).

This species, while clearly belonging to the section Macroptilium, is very unlike any species which I am familiar with.

EXPLANATION OF PLATE X.—Fig. *a*, plant; *b*, calyx; *c*, banner, *d*, wing; *e*, keel, *f* and *g*, stamens; *h*, ovary. *i*, seed. Fig. *a*, natural size; *b*, scale of 4; *c* and *d*, scale of 2; *e-i*, scale of 4.

Rhynchosia australis Rose, sp. nov.

Stems climbing; leaflets 3, ovate-lanceolate, acuminate and acute, sometimes 7 to 10 cm. long, thinnish in texture; racemes much longer than the leaves, 15 to 20 cm. long; corolla yellowish; calyx 14 to 15 mm. long; sepals slender, nearly equal; fruit not seen.

Collected by Mr. C. G. Pringle in a mountain canyon near Cuernavaca, Morelos, February 15, 1899 (No. 7863).

A species near *R. macrocarpa* Benth., but with thinner, less pubescent, and more acuminate leaflets, larger calyx, etc.

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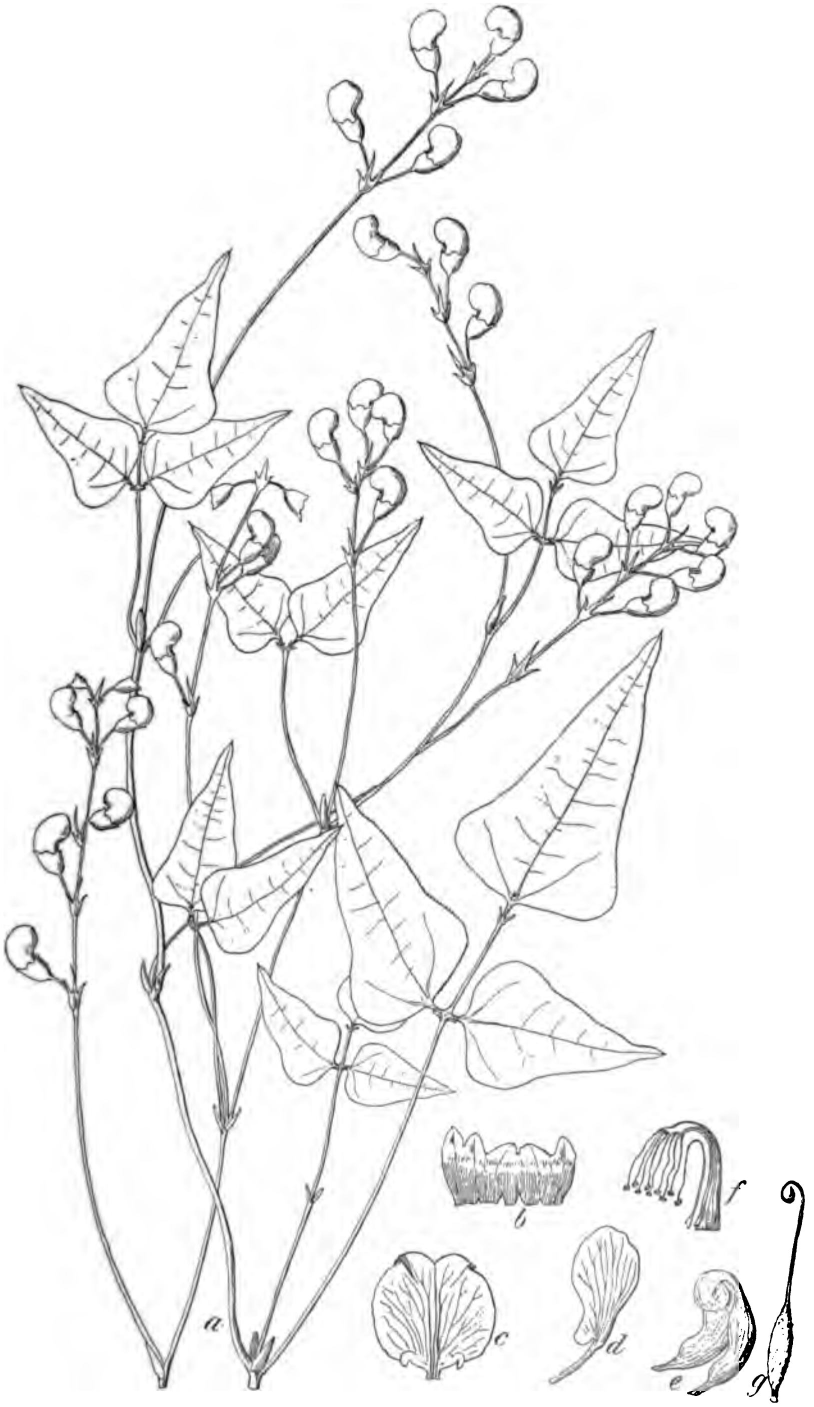
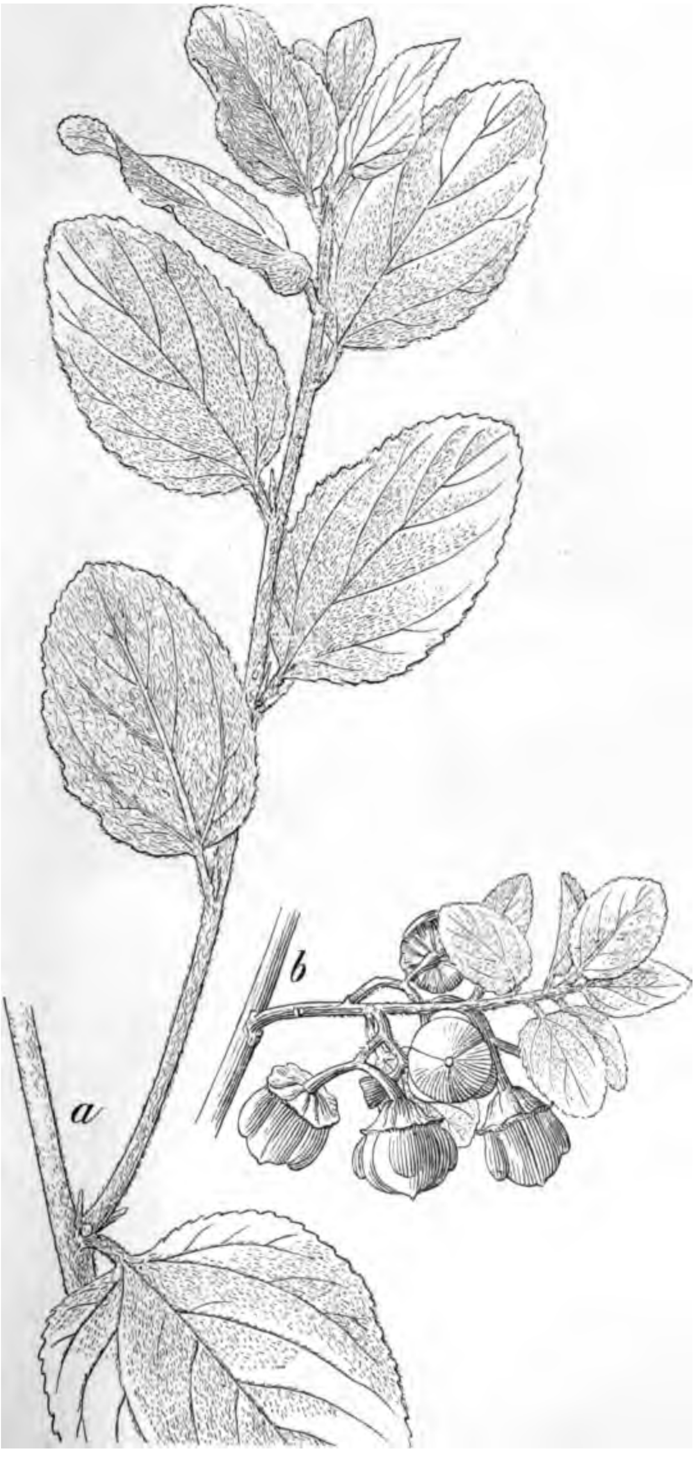
[a] For a synoptical treatment of the Mexican species of Nissolia, see Rose, Contr. Nat. Herb. vol. 5, p. 157.

PLATE IX.

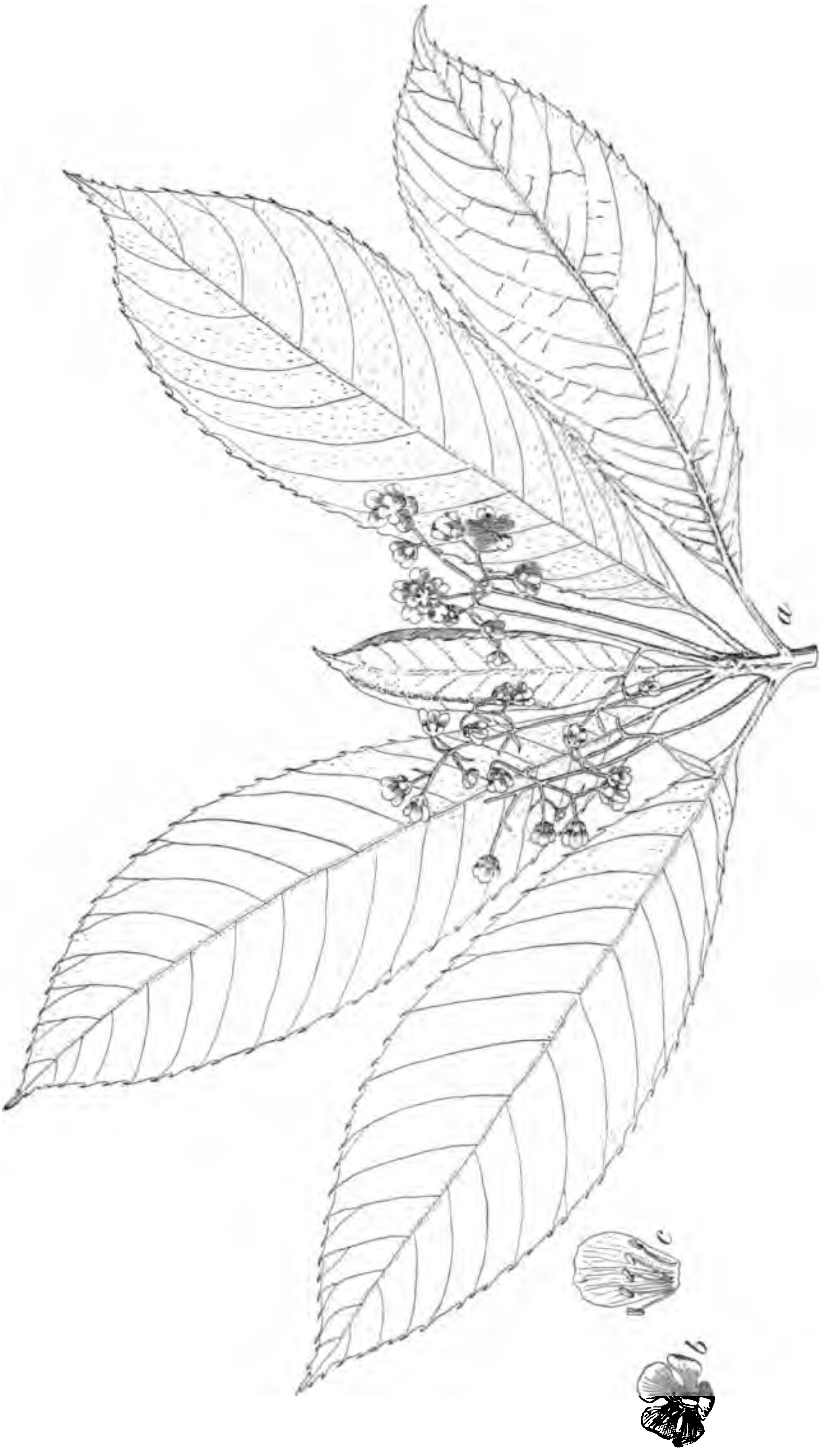


PHASEOLUS OAXACANUS ROSE.



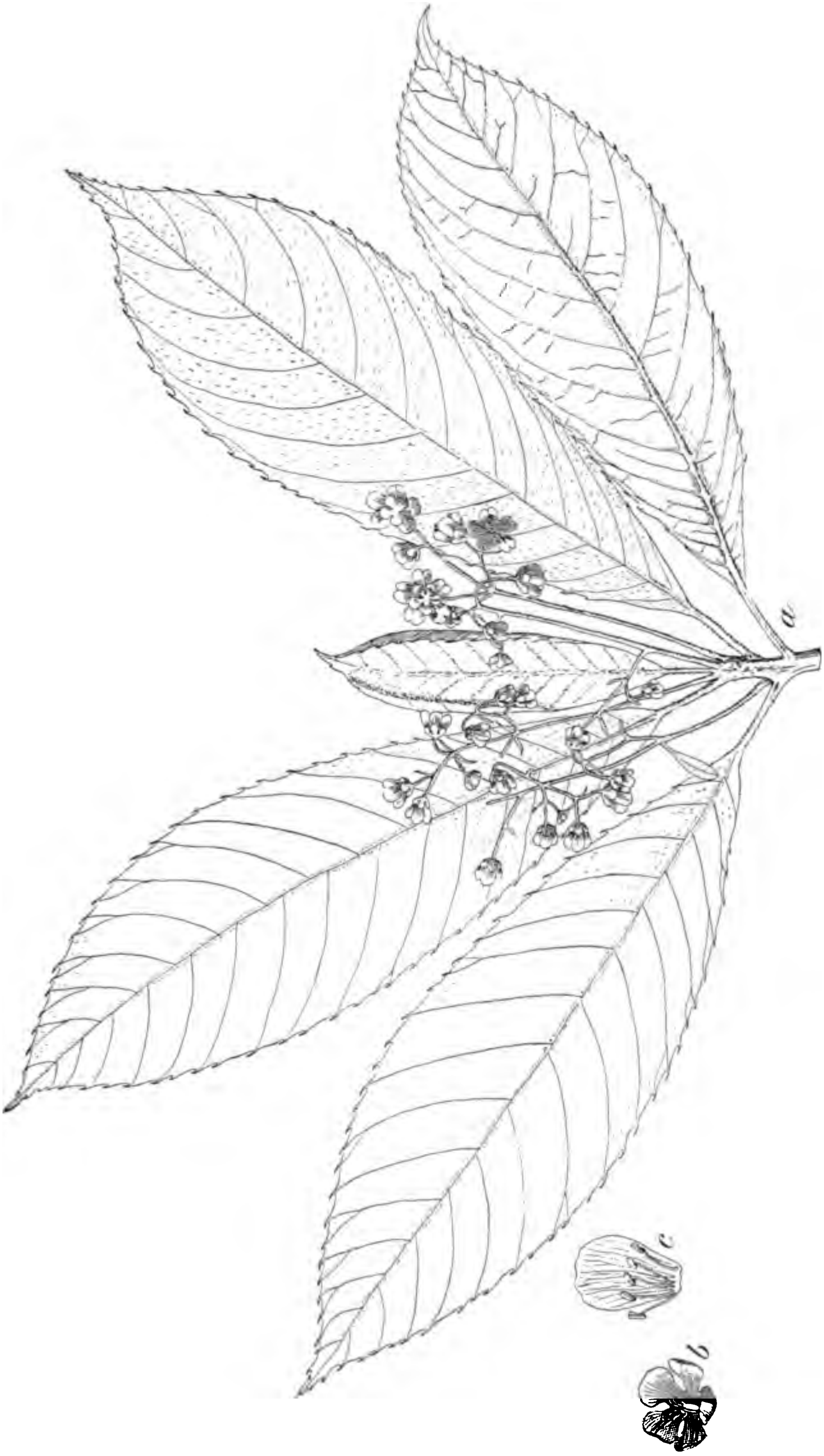
COLUBRINA MEGACARPA ROSE.

PLATE XII.



Saurauja pringlei Rose.

PLATE XII.



SAURAUJA PRINGLEI ROSE.

MALPIGHIACEAE.

NEW SPECIES OF THREE GENERA.

Aspicarpa lanata Rose, sp. nov. FIGURE 11.

Stems nearly simple, erect or somewhat spreading, 1 to 7 dm. high; young branches densely pubescent; leaves in verticels of three or opposite, broadly to narrowly oblong, apiculate, appressed-pubescent above, densely white-lanate beneath, short-petioled, 3 to 6 cm. long; calyx bearing eight glands; petals yellow, 6 mm. long; stamens 5, 3 fertile; style solitary; ovaries 3, 1 to 3 maturing into 3-angled pyramidal nutlets, 6 mm. long, the inner face angled above.

Specimens examined:

Jalisco: Near Guadalajara, Palmer, 1886 (no. 153), and Pringle, 1893 (no. 4222, type).

Durango: Near Huasemote, J. N. Rose, August 13, 1897 (no. 2214), and August 15 (nos. 3493 and 3501).

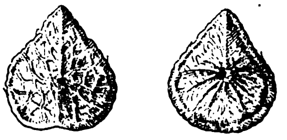


FIG. 11.—Fruit of *Aspicarpa lanata.*

Mr. Watson referred Palmer's plant to *Gaudichaudia mollis* Benth. and states that in respect to flowers and foliage it is identical with Hartweg's specimens. The fruit, however, is not that of Gaudichaudia, but rather that of Aspicarpa, with which it well agrees. Bentham's type (Hartweg's No. 14), a specimen of which is now in the Gray Herbarium, came from Zacatecas. This I have examined, and I am convinced that it is a totally different species.

Gaudichaudia subverticillata Rose, sp. nov.

Stems simple or somewhat branched, 5 to 8 dm. high, erect or nearly so, densely covered with a coarse appressed or spreading pubescence; leaves opposite or in verticels of 3, oblong, 5 to 10 cm. long, 1 to 3 cm. wide, apiculate, subsessile, rough-pubescent on both sides; inflorescence terminal, either strict or forming an open panicle; flowers usually in dense verticillate clusters; pedicels slender; calyx bearing 7 to 9 glands, 5-lobed; sepals 3 mm. long, oblong, obtuse, petals 5, 6 to 7 mm. long, yellow, with lacerate margin; stamens 5, all perfect; styles 3; samaræ 3, each surrounded by a thin marginal wing, 10 to 12 mm. in diameter, hardly if at all winged on the back, more or less pubescent.

Collected by J. N. Rose on the road between Huejuquilla and Mesquitec, Jalisco, August 25, 1897 (no. 2558, type), in the same State near San Juan Capistrano, August 23 (no. 2501) and near Huasemote, August 15 (no. 3492).

This species differs from all the other Gaudichaudia species in having three styles. The stamens are also all perfect. The fruit, however, is so clearly of this genus that I do not hesitate to refer it as above.

Hiraea parviflora Rose, sp. nov.

Shrub, 15 to 24 dm. high; young branches densely tomentose, the older brownish, becoming glabrate; leaves small, less than 2.5 cm. long, oblong, acute, rounded at base, densely tomentose on both sides, shortly petiolate; umbels 2-flowered, short-peduncled; pedicels slender, 12 mm. long, bibracteate some distance below the middle; calyx villose, 8-glandular; petals glabrous, orbicular, small, 4 mm. long, tapering at base into a slender claw, violet; stamens 10, glabrous, free nearly to the base; samaræ 3, villose, 14 mm. in diameter, the lateral wings giving a circular outline; dorsal wing very small.

Collected by Mr. C. G. Pringle on dry hills near Tehuacan, altitude 1,650 meters, November 27, 1895 (no. 6274).

MELIACEAE.

A NEW TRICHILIA.

Trichilia pringlei Rose, sp. nov.

A shrub, 4 to 9 meters high; branches gray, at first a little pubescent; leaves 2 to 3 dm. long; leaflets about 7 pairs, at first densely whitish-pubescent on both sides, in age much less pubescent, lanceolate, 2 to 7 cm. long, acuminate, but with obtuse apex, strongly oblique at base, entire; flowers in numerous panicles, clustered at the top, much shorter than the leaves; calyx 5-lobed; sepals obtuse, the margins ciliate, otherwise glabrous; petals 5, oblong, 8 to 10 mm. long, obtuse, glabrous; stamens 9, united nearly to the middle, nearly glabrous; style glabrous; ovary densely pubescent, 3 or 4 celled; cells 2-ovuled, one ovule above the other; capsule globular, 15 mm. in diameter, densely reddish-pubescent.

Collected near Cuernavaca, Morelos, on lava beds by C. G. Pringle, July 24, 1896 (no. 6394, type), and on the side of a barranca by J. N. Rose, May, 1899 (no. 4433).

This species does not belong to any of DeCandolle's sections, for it has the ovules of the *mollis* section and the petals of the *rubra* section.

RHAMNACEAE.

A NEW COLUBRINA.

Colubrina megacarpa Rose, sp. nov. PLATE XI.

Low shrubs, 10 to 15 dm. high; young branches rusty-pubescent, becoming glabrate; leaves attenuate, on the sterile branches much larger, orbicular to oblong, 4 to 7 cm. long, 2 to 6 cm. broad, rounded at base and apex, crenately toothed, somewhat pubescent above, densely lanate-pubescent beneath, 3 to 5 nerved at base; petioles very short (3 to 10 mm. long); flowers not seen, but evidently borne in small clusters on short peduncles; pedicels 5 mm. long; fruit pendent, very large for the genus, 1 cm. in diameter, at first fleshy, but becoming dry, dehiscing as in the genus; seeds brown, flattened, 6 mm. long.

Collected by C G. Pringle near Tehuacan, Puebla (no. 6761), and at the same locality by J. N. Rose, August 1 and 2, 1901 (no. 5852, type).

EXPLANATION OF PLATE XI.—Figs. *a* and *b*, leafy and fruiting branches, natural size.

NEW SPECIES OF RHAMNUS.

The following new species of Rhamnus are presented only after the most careful study of the descriptions and specimens of the Mexican species of this genus. The National Herbarium contains nearly all the reported species, but the number of specimens of each is limited to one or two sheets and therefore either flowers or fruit are often lacking. For this reason, in part, it is not practicable to publish a revision at this time. Another reason is that the generic position of several of the old species is in doubt, and therefore the types themselves should be restudied or fresh material should be collected from the type locality.

Rhamnus nelsoni Rose, sp. nov.

Shrub 12 to 24 cm. high; branches a reddish brown; leaves narrowly oblong, 5 to 7 cm. long, finely serrate, glabrous above, somewhat tomentose beneath; flowers not seen; fruits 2 or 3 in the axils on short peduncles, 4 to 6 mm. long, obovate in outline, 3-celled.

Collected by E. W. Nelson, between San Cristobal and Teopisca, Chiapas, December 4, 1895 (no. 3450).

Rhamnus obliqua Rose, sp. nov.

A small tree; branches long and slender with black bark; young branches, petioles, pedicels, stipules, and buds densely pubescent, usually with brownish spreading hairs; leaves lanceolate, 4 to 6 cm. long, shortly acuminate, rounded or somewhat narrowed at base, often oblique, dark green above, paler beneath, glabrous on both sides except along the midvein, the margin bluntly toothed; flowers in axils, probably few together; fruits (immature) one or two, rarely three, glabrous, globular; pedicels 3 to 5 mm. long.

On the Sacred Hill at Amacamaca, State of Mexico, collected by J. N. Rose, July 16, 1901 (no. 5498).

Somewhat resembling *R. serrata*, but with darker green leaves, different pubescence, stipules, serrations, etc.

Rhamnus revoluta Rose, sp. nov.

Young branches somewhat tomentose; leaves oblong, 5 to 7 cm. long, 2 to 3 cm. broad, obtuse at apex, generally rounded at base, finely serrate, the margin somewhat revolute, nearly glabrous above, at first almost tomentose, but in age the pubescence more scattered; umbels subsessile or distinctly peduncled, 6 to 8 flowered; pedicels 4 to 6 mm. long; calyx 3 mm. long, only slightly pubescent; petals small, broad, strongly retuse at apex; fruit not seen.

Collected by Mr. C. G. Pringle in the Sierra Madre near Monterey, Mexico, May 29, 1889 (no. 2539).

Rhamnus pringlei Rose, sp. nov.

A shrub 9 to 18 dm. high; young branches, foliage, peduncles (pedicels), etc., tomentose; leaves broadly oblong, 2 cm. long, obtuse or even retuse at apex, thin, rounded at base, serrate, on very short petioles; umbel sessile, few-flowered; pedicels 6 mm. long; calyx small, villous; petals broad, strongly emarginate.

Collected by C. G. Pringle near Oaxaca, Mexico, 1894 (no. 4662).

This species is nearest *R. palmeri*, but has much smaller, thinner, and less tomentose leaves, different petals, etc.

Rhamnus discolor (Donnell-Smith) Rose.

Rhamnus capreaefolia discolor Donnell-Smith, Bot. Gaz. **20**: 200. 1893.

This is a good species differing from *R. capreaefolia* in its pubescence, larger and paler leaves, usually peduncled umbels, etc.

Type locality "Coban," Guatemala.

VITACEAE.

A NEW AMPELOPSIS.

Ampelopsis mexicana Rose, sp. nov.

A high-climbing vine; branches long and slender, more or less brownish, glabrous and somewhat glaucous; tendrils branched; leaves 2 or 3 ternate; leaflets ovate, 3 to 5 cm. long, rounded or somewhat cuneate at base, shortly acuminate, serrate, somewhat pubescent; peduncles slender; secondary branches spreading, often nearly at right angles; calyx very small; petals 5 (?), spreading, less than 2 mm. long; style slender, short; fruit white, more or less inflated, becoming dry in age, 2 or 3 seeded; seed broader than long.

Collected by J. N. Rose near Acaponeta, Tepic, June 23, 1897 (no. 1455, type), and near Rosario, Sinaloa, July 8 (no. 1579).

This species comes nearer the United States species, *A. bipinnatus*, than any other I have seen, but has very different foliage. This seems to be the only representative of this genus in Mexico.

THEACEAE.

NEW SPECIES OF SAURAUJA.

Saurauja pauciflora Rose, sp. nov.

A low shrub; branches, leaves, peduncles, calyx, etc., covered with coarse, stiff, reddish hairs; leaves short-petioled, rounded at base, acuminate, sharply serrate, hairy above and on the midrib and veins below, also somewhat stellate beneath, 10 to 16 cm. long, 2 to 5 cm. broad; peduncles elongated, few-flowered; sepals orbicular, the inner ones less setose; corolla white.

Collected by E. W. Nelson near San Cristobal, Chiapas, altitude 2,100 to 2,640 meters, September 18, 1895 (no. 3206).

Saurauja nelsoni Rose, sp. nov.

Shrub; branches covered with coarse reddish hairs; leaves oblong, rounded at base and at apex, scabrous above, soft velvety-stellate beneath, 1 to 2 dm. long, 7 to 8 cm. broad, margin wavy, minutely toothed; inflorescence elongated, nearly as long as the leaves; sepals orbicular, 6 mm. in diameter, covered with short paleaceous hairs; petals orbicular, "pink," 10 mm. in diameter.

Collected by E. W. Nelson, near Totontepec, Oaxaca, altitude 1,122 to 1,670 meters, July 15 to 28, 1894 (no. 800).

Saurauja pringlei Rose, sp. nov. PLATE XII.

A small tree or shrub 18 to 30 dm. high; branches covered with appressed scaly hairs; leaves oblanceolate, wedge-shaped at base, abruptly acuminate, sharply serrate, roughly pubescent above, densely white-stellate beneath, 7 to 25 cm. long, 2 to 7 cm. broad; inflorescence much shorter than the leaves, open; sepals at first somewhat stellate, but becoming glabrate except the ciliate margin, two of them much constricted near the base, all rounded at the apex; petals white.

Specimens examined:

Oaxaca: Sierra San Felipe, altitude 2,550 meters, C. G. Pringle June, 1894 (no. 4668, type); west slope of Zempoaltepec, altitude 2,210 to 2,400 meters, E. W. Nelson, July 5 to 13, 1894 (no. 606).

EXPLANATION OF PLATE XII.—Fig. *a*, branch; *b*, calyx; *c*, petal and stamens. Fig. *a*, scale of ½; *b* and *c*, scale of 2.

Saurauja reticulata Rose, sp. nov.

A shrub or small tree; branches scurfy-pubescent, somewhat pilose at the nodes; leaves short-petioled, oblong or oblanceolate, rounded at the apex, when mature nearly glabrous except for patches of wool in the axils of veins, 1 to 2.5 dm. long, 5 to 10 cm. broad, finely serrate, the teeth tipped with a deciduous bristle, strongly reticulate beneath; peduncles elongated; sepals orbicular, covered with small paleaceous hairs, ciliate on the margin; petals white.

Collected by C. G. Pringle near Cuernavaca, February 15, 1899 (no. 7862).

This species is nearest *S. serrata*, but has different leaves, is pubescent on the sepals, grows at a much higher altitude, etc.

CORNACEAE.

THE MEXICAN SPECIES OF CORNUS.

Hemsley cites five species of Cornus from Mexico. Of these the two United States species, *florida* and *stricta*, are probably to be excluded. *C. excelsa* and *C. tolucensis* are very similar to each other and difficult to distinguish. *Cornus disciflora* embraces two species, one with leaves very pale beneath and with appressed hairs, answering to *C. grandis*, and a second with woolly pubescence, which may or may not be *C. disciflora*. I have also distinguished below a beautiful species of the *C. florida* type. A species from north Mexico collected by E. W. Nelson I have also described as new. The following key is simply suggestive:

KEY TO SPECIES.

Flowers in dense head-like clusters.
Bracts of involucre very large, petal-like .... 1. *C. urbiniana.*
Bracts of involucre small.
Pubescence on under surface of leaves woolly .... 2. *C. disciflora.*
Pubescence on under surface of leaves not woolly .... 3. *C. grandis.*
Flowers in more or less open cymes.
Leaf margins undulate; lateral veins 5 or 6 pairs...................... 4. *C. nelsoni.*
Leaf margins entire; lateral veins 2 or 4 pairs.
Pubescence on under surface of leaves soft and somewhat spreading and woolly. 5. *C. excelsa.*
Pubescence on under surface of leaves harsh and closely appressed.
Leaves narrowly lanceolate....................................... 6. *C. tolucensis.*
Leaves broadly lanceolate .... 7. *C. lanceolata.*

1. **Cornus urbiniana** Rose, sp. nov.

Branches glabrous; leaves lanceolate, narrowed at base, acuminate, densely strigose on both sides, sometimes almost lanate beneath; involucral bracts pinkish, 5 cm. long, 2 cm. or more broad, tapering at base.

Collected by Dr. Manuel Urbina on Cerro de San Cristobal near Orizaba, April, 1891. Type specimen in National Herbarium, duplicate in herbarium Museo Nacional, City of Mexico.

This species is of the *florida* type, but has much larger and comparatively narrow bracts, etc. Here probably belongs the *Cornus florida* referred to by Mr. Hemsley in the Biologia.

This beautiful species is named for my good friend Dr. Urbina, acting director of the National Museum of Mexico, by whom it was collected, and to whom I am under many obligations.

2. **Cornus disciflora** DC. Prod. **4**: 273. 1830.

I have not been able to distinguish by the descriptions *C. disciflora* from *C. grandis*. Both were described in 1830, and so far I have not been able to make out which name should be given the preference. While it is very likely that the two descriptions refer to the same species, as Mr. Hemsley believed, yet I find two species in our so-called *C. disciflora*, the name usually adopted for this group. *C. grandis* has been fully characterized, and this name can be satisfactorily given to one of these species, and will be retained for it in case *C. disciflora* is not an older name or in case it belongs to a different species. *C. disciflora* is not so easily made out, as it is based on a tracing of Moçino and Sessé's and a specimen of Berlandier's, for neither of which we have a definite locality given. From what we know of Berlandier's field of exploration it seems probable he would have collected what is here called *C. grandis.* The species, however, is to be based upon the tracing, but in what part of Mexico the material was found from which it was made no one can tell. On account, therefore, of the uncertainty as to what the true *C. disciflora* is, it seems best to retain the name for the species which remains after the segregation of *C. grandis.*

This species differs from *C. grandis* in the peculiar woolly pubescence on the under surface of the leaves.

Common in deep canyons along streams on the top of the Sierra Madre.

Collected by J. N. Rose, near Santa Teresa, August 10, 1897 (no. 2176), and in the State of Durango, August 18 (no. 2371); at San Nicholas, Valley of Mexico, 1865–66 (no. 998).

This species was also collected by Seemann, in the Sierra Madre, the exact locality not given, but probably near the first of the stations mentioned above.

3. **Cornus grandis** Cham. & Schlecht. Linnæa **5**: 171. 1830.

Type locality: "In sylvis prope Jalapam."

No material has been seen from the type region of this species. The writer has collected at Cuernavaca specimens which seem to belong here, although they come from a somewhat higher elevation. If this material is properly referred the species has a pretty wide distribution extending from the State of Michoacan to Oaxaca, and is generally found in collections labeled *C. disciflora.*

4. **Cornus nelsoni** Rose, sp. nov.

Shrub, 12 to 24 dm. high; branches dark red, nearly smooth; leaves opposite, lanceolate, acute, rounded or sometimes slightly tapering or often oblique at base, 6 to 10 cm. long, 2 to 3 cm. broad, dark green and slightly pubescent above, whitish and with appressed malpighiaceous hairs (as well as simple hairs in the axils of the veins) beneath; inflorescence an open cyme; flowers not seen; fruit white, very fleshy; stone slightly longer than broad (6 by 5 mm.), flattened, furrowed on the margin and with 3 fainter lines on each side.

Collected by E. W. Nelson on road between San Julian and Guadalupa y Calva, altitude 2,100 to 2,400 meters, September 7, 1898 (no. 4927).

Very unlike all the species of Cornus heretofore reported from Mexico.

5. **Cornus excelsa** H. B. K. Nov. Gen. & Sp. **3**: 430. 1818.

Type locality: "Inter Chalco et Urbem Mexici."

I have not examined the type of this species, but have collected in the Valley of Mexico near Humboldt's station material which answers his description. This species is closely related to *C. tolucensis;* my material shows difference in pubescence and has broader and more ovate leaves and more spreading inflorescence.

Specimens examined:

Federal District: On the Pedregal in the Valley of Mexico, Bourgeau, 1865–66 (no. 55); also in the same region, C. G. Pringle, June, 1896 (no. 6305); in hedge near Tlalpam, J. N. Rose, July 18, 1901 (no. 5541).

6. **Cornus tolucensis** H. B. K. Nov. Gen. & Sp. **3**: 430. 1818.

Type locality: "Juxta urbem Toluca."

I have not examined the type of *Cornus tolucensis* nor have I seen material from the type locality, but I have collected material both to the north and south of Humboldt's station, which is near the city of Toluca at an altitude of 2,800 meters. My specimens have narrow leaves, 6 to 25 mm. broad, gradually tapering into an acumination and with appressed pubescence; inflorescence very compact, in flower almost head-like.

Collected by J. N. Rose near Santa Fe, Federal District, in Valley of Mexico, July 11, 1901 (no. 5370), and near Tlapujahua, Michoacan, July 12, 1901 (no. 5402.)

7. **Cornus lanceolata** Rose, sp. nov.

A small tree, 4 to 6 meters high; branches slender, brownish; leaves broadly lanceolate, 5 to 10 cm. long, 2.5 to 6 cm. broad, abruptly long-acuminate, rounded or somewhat tapering at base, pubescent on both surfaces with rather scanty appressed malpighiaceous hairs, with usually 4 pairs of rather prominent lateral veins; inflorescence a densely flowered terminal cyme, becoming in fruit 5 to 6 cm. broad, more or less pubescent with blackish hairs; buds usually densely cinereous, the lower part or calyx more decidedly so; calyx teeth minute, ovate, acute; petals 5 mm. long; anthers nearly as long as the petals; anthers bluish; styles slender, thickened at apex, slightly pubescent.

Specimens examined:

Vera Cruz: near Jalapa, J. N. Rose and Walter Hough, May 17, 1899 (no. 4240); same locality and date, C. G. Pringle (no. 8199); Orizaba City, Botteri (no. 262).

Morelos: near Cuernavaca, Rose and Hough, May 27–30 (no. 4422). Type, Rose and Hough's no. 8199.

This species has heretofore been passing as *C. tolucensis*, but seems to be distinguished by its much broader and larger leaves, larger cymes, and darker branches. It grows at lower altitudes and in a more humid zone. Other characters are to be looked for in the fruit, but as yet neither species has been collected with mature fruit. Schlechtendal first studied this species and doubtfully referred it to *C. tolucensis.*

A NEW GARRYA.

Garrya longifolia Rose, sp. nov.

A small tree; branches pubescent; leaves oblong-elliptical, obtuse, sometimes apiculate, 8 to 15 cm. long, 1.5 to 3.5 cm. wide, when mature nearly glabrous and reticulated above, lanate beneath; fruit orbicular, pubescent, the lower ones short-pedicelled, the upper ones subsessile, bracts linear, elongated.

Collected on the Sierra de Topoxtlan, altitude 2,250 meters, by C. G. Pringle, March 15, 1899 (no. 6988).

Although the Mexican species of this genus are difficult to characterize, this one is very different in its appearance from all the others.

CUCURBITACEAE.

A NEW SCHIZOCARPUM.

Schizocarpum reflexum Rose, sp. nov.

Stems angled, climbing, with pubescence of two kinds, namely, of scattered coarse, jointed hairs and of short, dense, glandular hairs; tendrils 2-branched, one branch much longer than the other; petioles a little shorter than the blades, with pubescence like that of stem; leaves ovate, 5-lobed, the terminal lobe more elongated, ovate, acute, and apiculate, the others short and rounded, with minute teeth, somewhat glaucous and glabrous above, except near the margin, and except on the slightly roughened midrib, densely appressed-pubescent beneath; sinus broad and rounded, the lateral lobes almost meeting; flowers solitary in the axils; peduncles 5 to 8 cm. long; peduncles (as also sepals and petals in bud) with pubescence like stems; sepals ovate, linear, very early reflexed in the bud; corolla yellow, 5 to 6 cm. long; lobes ovate, acute, erect.

Collected by C. G. Pringle on mountains near Iguala, September 27, 1900 (no. 9252).

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VOLUME VIII, PART 2

ECONOMIC PLANTS OF PORTO RICO

By O. F. COOK and G. N. COLLINS

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NOTE.

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II

PREFACE.

One influence of the extension of American jurisdiction over Porto Rico and the Philippine Islands, in the year 1898, was to create a demand for information about the vegetation of those islands. All contained a tropical flora, and American botanists had devoted little attention to the study of tropical plants. The information demanded regarding the Porto Rican flora was largely of a popular and commercial character and was not at all to be satisfied by the existing and available technical works on the West Indian flora. In the course of their investigations on tropical agricultural plants in Porto Rico, Mr. O. F. Cook, botanist in charge of investigations in tropical agriculture, Department of Agriculture, and his assistant, Mr. G. N. Collins, have collated a large amount of information on the economic plants of that island such as is not suitable for incorporation in their detailed reports on staple and special agricultural plants, which are published by the United States Department of Agriculture. This information has been brought together in the present paper on Economic Plants of Porto Rico. Fortunately the plant names in use among the people of Porto Rico are applied with approximate precision, so that by adding the botanical identification of a plant to its Porto Rican popular name we have in most instances a direct key to its botanical name and position. The use of illustrations reproduced from good photographs conveys in a simple and direct way information which no amount of technical description could replace. Availing themselves of personal observation, the facts published by others, a study of collections, the use of photographs, and the intimate personal knowledge the Porto Ricans have of their useful plants, the authors have produced a work which will be of great value to botanists and to all other persons seeking information about the common and useful plants of Porto Rico.

FREDERICK V. COVILLE,
Curator of Botany.

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ECONOMIC PLANTS OF PORTO RICO.

By O. F. Cook and G. N. Collins.

INTRODUCTION.

Very few tropical countries have been provided with satisfactory manuals of botany by means of which the resident or the traveler can identify the plants and secure access to information regarding their uses and other noteworthy characteristics.

There is, as yet, no manual of the botany of Porto Rico nor any handbook of tropical cultivated plants which can be recommended to those who seek an introduction to the indigenous flora of the island and the economic species grown for food, ornament, and other purposes, or escaped and intermingled with the native vegetation. Fortunately, however, clues to the identity of a large proportion of the plants of Porto Rico are readily obtainable through the medium of the common names. The natives of Porto Rico have been noted by many travelers as having a larger series of popular names and as using them with more precision than the inhabitants of other parts of the American tropics. Certain it is that many species have received separate names in Porto Rico which in Cuba are not distinguished except by botanists. This fact is to be connected, perhaps, with the existence of a large rural population, which has preserved many names obtained from their Indian ancestors and the Spanish settlers with whom these amalgamated. The names are in many cases entirely local, not known outside the island, and quite different from those applied in Mexico and Cuba. It is accordingly believed that a list of Porto Rican names of economic plants, although necessarily imperfect, would be of special convenience at the present juncture when the native population is beginning the study of English and while numerous Americans are struggling to comprehend the language, products, and vegetation of a new and interesting country.

Some plants have several common names which may be confined to different districts, and in some cases the same names are applied to different plants in different places. Of course this popular knowledge lacks scientific accuracy and frequently breaks down when similar species are in question. The identification of single individuals should always be verified by cumulative testimony and a consensus of the most intelligent opinion obtainable.

ECONOMIC PLANTS IMPERFECTLY KNOWN.

Owing partly to the fact that some of the botanists who have written most extensively on the West Indian flora have carefully avoided reference to the uses of the plants they studied, our knowledge of the economic plants of the West Indies is still in a very fragmentary condition. Moreover, a considerable amount of the existing literature is now out of date and unreliable on account of the uncertainty attaching to many of the names used by the earlier semipopular writers. The British West Indies have received the most attention, and the French islands are second in the amount of printed information. On the Cuban flora, as well, a considerable body of literature exists, in comparison with the extreme paucity of scientific information regarding Porto Rico. The island has not attracted, to any considerable extent, the interest of European or American naturalists, and the local prosecution of study received only negative encouragement.

Although the area is small, the topography is so complicated and the climatic and other conditions so varied that anything like an exhaustive knowledge of the wild plants will be very difficult to obtain. In the case of the cultivated economic species the same difficulty of extreme localization is apparent. Plant introduction has been carried on only in an extremely desultory manner. Transportation is difficult, and the numerous towns have had connection, for much of the time, only by sea, so that the dissemination even of successful species has been slow and difficult.

It is manifestly impossible to enter to best advantage upon the task of improving agricultural conditions in Porto Rico without more adequate knowledge of the nature and results of past experiments, and it would be useless and wasteful to reintroduce species already growing in the island except where superior varieties can be secured.

MATERIALS INCLUDED AND ARRANGEMENT OF LIST.

This paper includes miscellaneous information on the principal cultivated plants of Porto Rico, brief notes on many of the minor economic plants, and a list of all the native names of plants which have thus far been recorded from the island, with references to the scientific names of the species to which they are applied as far as these have been determined. As there are no botanical publications in either English or Spanish which give an even approximately complete treatment of the flora, it is believed that the present list of names and the brief notes accompanying will be found of use both to visitors and to residents of the island.

Owing to the fact that the same name is often applied to similar though botanically distinct species, and that various names are used for the same species in different parts of the island, it has seemed best in the preparation of this list not to separate the information from the native name with which it was collected except where the botanical identity of the plants has been established, even though a guess might have been made with some probability of correctness. By the system of cross references it will, however, be possible for those who make use of the index to find all the available information, wherever classified.

MISPLACED COMMON NAMES.

Although sufficiently reliable to be of much assistance to strangers who desire to secure acquaintance with the local flora, the application of names in Porto Rico is in many cases misleading, well-known terms being used in the most novel relations. Thus the "níspero" of Porto Rico is not the loquat or Japanese medlar (*Eriobotrya japonica*) as in Spain, but the sapodilla (*Achras sapota*). Quite a list of such misapplied names might be made, but a few of the more prominent will suffice to show how unreliable are inferences drawn from verbal or even from written information which is not based on actual contact with the objects. Thus in Porto Rico the—

Almendra (almond) is *Terminalia catappa*.
Ciruela (plum) is *Spondias purpurea*.
Castaña (chestnut) is *Artocarpus communis*, the bread fruit.
Níspero (loquat) is *Achras sapota*, the sapodilla.
Nuez moscado (nutmeg) is *Nectandra* sp.
Pimienta (pepper or allspice) is *Amomis caryophyllata*, the bay-rum tree.
Reseda (mignonette) is *Lawsonia alba*, the henna.
Almacigo (mastic) is *Bursera simaruba*, the West Indian birch.
Cereza (cherry) is *Cordia collococca* and other species.

Many plants also have different local names. Those supplied by Captain Hansard are mostly from the vicinity of Luquillo in the northeast corner of the island, and although they are names of trees several are not known to be used in other parts.

The English names of economic plants have also been included in this index, as far as practicable, in order to render the more certain the application of the Porto Rican designations for those who may have had previous experience in other tropical countries. The list of "colonial names" appended to Grisebach's flora has been drawn upon for this purpose to a limited extent, but is generally very unsatisfactory for the reason that the locality where a name is used is not given.

The names, English and Spanish, of some of the better known minor economic plants not yet recorded by botanists as growing in Porto Rico have been included in instances where these plants are known to have been introduced, and especially when they have become naturalized, in neighboring islands. It is extremely probable that some of these are already planted locally in Porto Rico, and as to those which are not it is desirable to know the probabilities of their success and whence they may be most conveniently obtained.

REFERENCES TO BOTANICAL LITERATURE.

There is as yet nothing like a complete list of the plants of Porto Rico, and most of the literature is not even indexed. It has therefore seemed desirable, as a matter of convenience for those who may wish to become more familiar with the flora of the island, to add references to descriptions of many of the species enumerated below, although in the present paper no attempt has been made to follow the method or arrangement of formal botanical literature. Nor should it be inferred that the author cited is in all cases responsible for the statements accompanying a specific reference, although this is generally true where very short notes are given. The more recent literature of Urban has been cited in preference to the older writings in order to avoid multiplication of references, and because Urban generally gives complete synonymy from which the opinions of other writers can be traced.

BOOKS ON PORTO RICAN PLANTS.

The botany of Porto Rico is far from complete, and very little of it has been written in the English language. Descriptions of plants found in Porto Rico are scattered through a vast number of publications which can not be enumerated here, but brief notices of the more important papers may not be out of place. But two authors have attempted a connected sketch of the Porto Rican flora, and the efforts of these not only remain incomplete in that they do not cover the entire series of families of flowering plants, but the lists are also partial and local, as the writers themselves realized.

The first of these sketches was that of Don Domingo Bello y Espinosa.[a] This consists almost entirely of a list of plants occurring, as explained by the author, in the triangular area included between Aquadilla, Lares, and Guanica. The prefatory note states that the writer resided in Porto Rico for thirty years, presumably at Mayaguez, and that his botanical studies were carried on in the intervals of a busy professional life. Considering this fact and the other difficulties under which he must have labored, the result is certainly most creditable, and the field observations and notes represent a distinct contribution to our knowledge of the flora of the area covered, although the adjustment of Bello's systematic treatment has given his successors considerable trouble. Many popular names are given, but no economic notes are included, although the useful species are not omitted from their places in the natural sequence. Several new species are described, and the probable existence of others is often suggested.

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[a] Domingo Bello y Espinosa. Apuntes para la flora de Puerto-Rico. Anales de la Sociedad española de historia natural, tomo X, pp. 230-304, 1881; tomo XII, pp. 103-130, 1883.

The second of these sketches and the most important contribution to the botany of Porto Rico is the Flora[a] projected by Dr. A. Stahl, of Bayamon, but unfortunately only partially published. Although of German paternity Dr. Stahl is a native of Porto Rico, and his scientific achievements are the result of tireless energy and perseverance under the most discouraging circumstances. Not only did he receive no public or official assistance or encouragement in the self-imposed task of making known the flora of the island, but his scientific labors drew upon him instead the suspicions of the government, and resulted in imprisonment and banishment on three or four occasions, without the satisfaction of even an alleged reason for his arbitrary ill treatment. In spite of public indifference and official animosity six parts of the Flora were issued, at the expense of the author, having been prepared in the intervals of his professional life as a physician. Publication ceased in 1888, and Dr. Stahl no longer hopes to continue the work. In addition to his botanical studies Dr. Stahl has written and made collections bearing upon medical, archæological, and zoological subjects, and has well earned the distinction of being the first resident Porto Rican naturalist. The common names of Dr. Stahl's Flora appear also in Professor De la Maza's Diccionario,[b] in which other names not yet reported from Porto Rico have been found and verified.

Further acknowledgement is due to Capt. Arthur C. Hansard, a retired English officer, for several years resident in the northeastern part of the island. A list of native names previously published by him in the San Juan News was carefully copied and the author then most obligingly revised and extended it, submitting as well to many questions which his extended residence and previous travels in other tropical countries rendered him particularly qualified to answer.

Apparently unknown to subsequent writers, a much more extended list containing the popular names of nearly 200 Porto Rican woods, with data regarding density, size, color, texture, and uses had appeared as a catalogue of a collection exhibited at the Agricultural Exhibition held in Madrid in 1857. This list has been safely preserved and securely hidden away in a bulky quarto volume entitled Memoria sobre los Productos de la Agricultura española reunidos en la Exposicion general de 1857, published in Madrid between 1859 and 1861, and containing over 1,200 pages. The Porto Rican woods occur on pages 470 to 477 and are interjected among other material with which there is little apparent connection. Neither is there any statement as to the authorship or origin of the list, nor is it surprising that Maza,

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[a] **Stahl, A.** Estudios para la flora de Puerto-Rico. 1884–1888.

[b] **Manuel Gómez de la Maza.** Diccionario botánico de los nombres vulgares cubanos y puerto-riqueños.

Hill, and other authors have overlooked it in making their compilations. The spelling of many names is different from that found elsewhere and there are some evident typographical errors, such as "diametro en pies," which must be intended for inches, as well as impossible specific gravities probably due to careless proof reading. On the whole, however, this anonymous contribution is an important one, and certainly represents a large amount of work. Many of the names are not yet identifiable botanically and the data are in such cases placed with the Porto Rican designation. Credit is given to "Exp. 1857," since a personal reference to the author is impossible.

For data respecting the characters and uses of woods we have drawn very freely upon Grosourdy's rare and valuable work on West Indian botany.[a]

The native names used in the publications of Mr. Robert T. Hill, as well as those appearing in other recent works upon Porto Rico, have also received consideration, with the intention of rendering as definite as possible the information which has been collected.

PERSONAL FIELD WORK, ACKNOWLEDGMENTS, AND DESIDERATUM.

The writers made two trips to Porto Rico, one in 1899, the other in 1901, which covered the different types of floral and agricultural areas of the island. The specimen numbers cited in the catalogue refer to the collections made on these visits.

In the labor of compiling data from these and other sources we have received much friendly assistance from Messrs. Henry E. Baum, Edgar Brown, and William R. Beattie, of the Office of Botanical Investigations, Department of Agriculture, to whom our thanks are tendered herewith.

Not all the native names of woods and other plants have yet been identified botanically, and authentic flowering or fruiting specimens of such will be welcomed by the authors. Such specimens for identification should be of reasonable size—that is, 12 or 15 inches in length—and should be pressed and dried before mailing, otherwise they may arrive in a decayed condition and utterly worthless for study. With correspondents who will take the trouble to prepare good specimens of economic plants and information concerning their local names and uses, arrangements will be made for the transportation of packages without cost to the sender.

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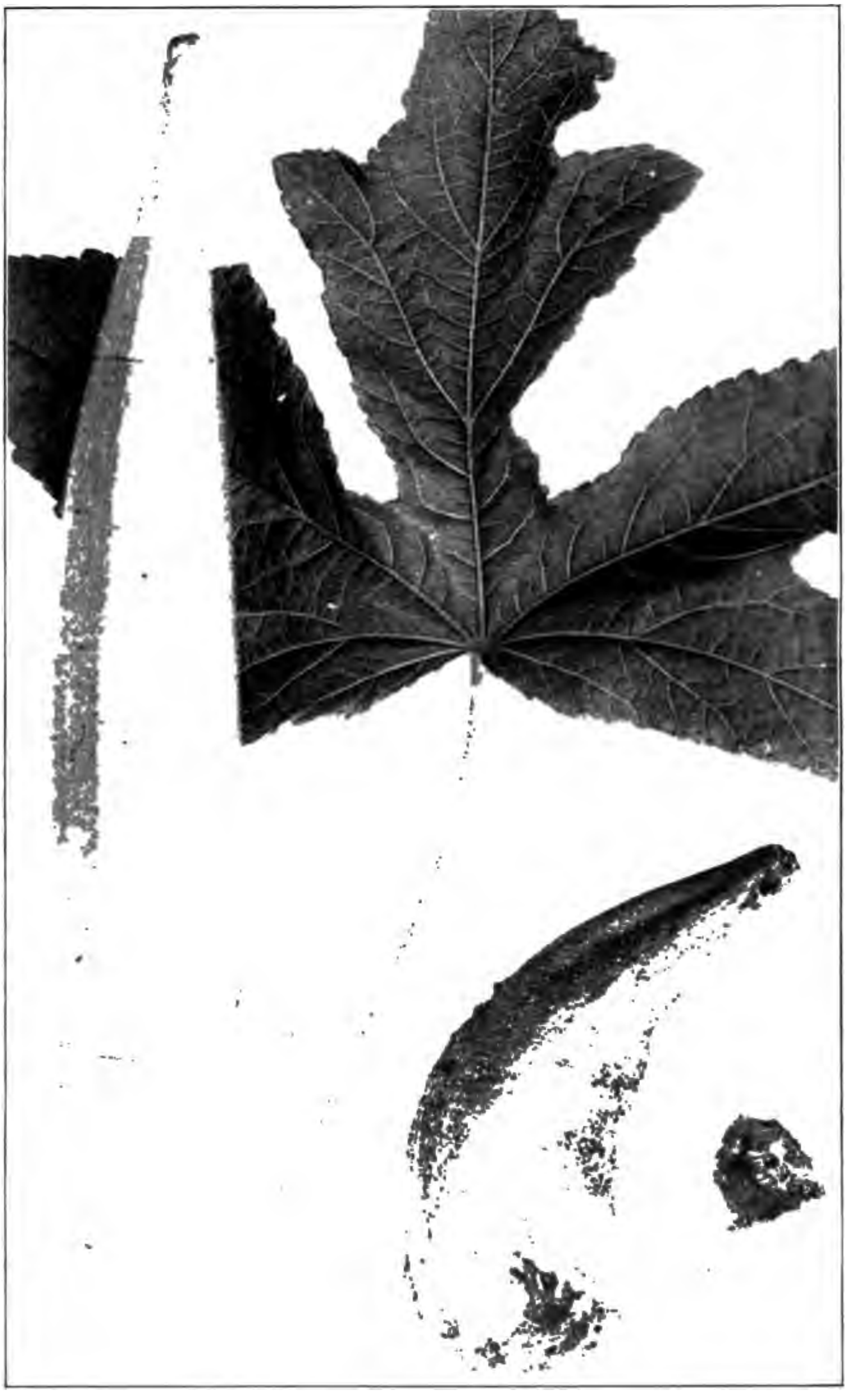
[a] Grosourdy, René de, M. D. El médico botánico criollo. 1864. 4 vols.

PLATE XIV.



Okra (Abelmoschus esculentus), Showing Healthy and Diseased Fruits.

CATALOGUE OF ECONOMIC PLANTS OF PORTO RICO.

Abacá. See *Musa textilis.*

Abejuelo.

A name given in Grosourdy, evidently the same as Abeyuelo and Abelluelo, with which the dimensions agree. The above author describes the wood as rose-colored, strong, and breaking with a vertical fracture. Commonly used for shelving. (Grosourdy, 2: 356.)

Abelluelo. See *Colubrina ferruginosa.*

Abelmoschus abelmoschus. ALGALIA.

Family Malvaceae; an annual or biennial shrub, 1 to 2 meters high, cultivated for the flowers and for the seeds, which have a strong odor of musk. At Cataño this was called "caballo asi." (Stahl, 2: 87, as *Abelmoschus moschatus.*)

Abelmoschus esculentus. GUINGAMBO. OKRA. PLATE XIV.

A woody annual or biennial, 1 to 3 meters high, cultivated for its large fruit capsules, known as "okra" and "gumbo." Bello notices two varieties, one pyramidal, and the other cylindrical, the latter being more delicate. (Stahl, 2: 86.)

Abeyuelo.

A tree from the northern parts of the island; height, 40 to 50 feet (12 to 15 meters); diameter, 12 to 14 inches (30 to 35 centimeters). Wood rose-colored, hard; specific gravity, 0.903; used in cabinet-making. (Exp. 1857.) Probably this is intended for the same name as abelluelo.

Abispillo.

A forest tree reported by Captain Hansard from the vicinity of Luquillo. Wood not used; specific gravity, 0.75. Perhaps the same as "avipillo" of Sintenis. *Mayepea caribaea*, from Fajardo; avispillo is said to be *Turpinia paniculata.* A tree from all parts of the islands; height, 40 to 50 feet (12 to 15 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood chestnut-brown, hard; specific gravity, 0.601; used for lumber. (Exp. 1857.)

Grosourdy describes it as a tree abundant in all parts of the island, 40 to 50 feet (12 to 15 meters) high, 12 to 24 inches (30 to 60 centimeters) in diameter. The wood is said to be brittle, breaking with an oblique fracture; the heart brown; the sapwood white; used for flooring. (Grosourdy, 2: 356.)

Abrojo. See *Tribulus cistoides* and *T. maximus.*

Abrus precatorius. PERONIA.

A climbing, leguminous shrub; pubescent, biennial; partial to sandy soil; flowers in summer and autumn. The small, bright-red beans are extremely hard and are used as beads for rosaries. A highly toxic albuminoid, derived from this species, has been described under the name abrine. (Stahl, 3: 51.)

Abutilon leiospermum. PICHANA MOCHA.

Family Malvaceae; a pubescent shrub, common on the south side of the island. (Stahl, 2: 73.)

Abutilon pedunculare. PICHANA PEDUNCULAR.

Not found by Stahl on the north side of the island: reported by Bello from the south side.

Abutilon periplocifolium. See *Wissadula rostrata.*

Abutilon umbellatum. MALVAVISCO CIMARRON.

From the vicinity of Coamo (Sintenis). The common name was heard at Santurce.

Acacia amarilla. See *Albizzia lebbek.*

Acacia angustiloba.

A leguminous plant, reported from Porto Rico by Bello, with the common name "cojobilla," but Stahl thinks the identification erroneous, and would refer Bello's plant to *Piptadenia peregrina.*

Acacia arabica. GUM ARABIC TREE.

A native of the drier districts of Egypt, the Soudan, and East Africa. Cultivated in Jamaica and other islands of the West Indies and, according to Grisebach, naturalized in Antigua. It might be worth while to plant this species in the dry southwestern part of Porto Rico.

Acacia berteriana. ACACIA SILVESTRE.

According to Stahl, a small tree of 3 to 5 meters, preferring the summits of hills and shady situations. According to Grisebach, this species is abundant in some localities in Jamaica. Bello gives the common name "cojoba" for this species. (Stahl, **3**: 150.)

Acacia farnesiana. AROMO.

A small tree introduced from the Old World: cultivated and now growing spontaneously in many parts of the West Indies, including Porto Rico. In the Mediterranean region it is extensively grown for the fragrant flowers, which are used in the manufacture of perfumery.

The wood is very heavy and solid, reddish-brown in color, and very handsomely grained. It is nearly all heart and has a specific gravity of 1.117. This wood can be used to good advantage wherever strength and durability are required. It would appear that it would also be suitable for furniture. (Grosourdy, **2**: 362.)

Acacia lebbek. See *Albizzia lebbek.*

Acacia nudiflora. ACACIA NUDOSA.

Stahl considers the occurrence of this species in Porto Rico doubtful, but it is known from St. Thomas and the neighboring Virgin Islands; also from Haiti. (Stahl, **3**: 147.)

Acacia nudosa. See *Acacia nudiflora.*

Acacia palida. See *Leucaena glauca.*

Acacia puertoriqueña. See *Calliandra portoricensis.*

Acacia sarmentosa. ACACIA ZARZA.

A climbing, spiny shrub, widely distributed in the West Indies and South America. By some considered synonymous with *A. riparia.* (Stahl, **3**: 148.)

Acacia sylvestre. See *Acacia berteriana.*

Acacia zarza. See *Acacia sarmentosa.*

Acajou. See *Guarea swartzii*; also *Swietenia mahagoni.*

Acaju. See *Anacardium occidentale.*

This and the preceding are different spellings of the same word, evidently of French origin, in which language it is more properly applied to *Swietenia mahogoni*, but is also used with *Anacardium occidentale* and *Cedrela glaziovii.*

Acalypha bisetosa.

Family Euphorbiaceae; found by Sintenis, growing wild in the mountains near Yabucoa. Other species are cultivated as ornamentals.

Acana. See *Labourdonnaisia albescens.*

A tree growing on hills; has great girth and height. The wood has a specific gravity of 1.09 and makes fair boards, good for boat building. It has a dry, white fruit, similar in taste, but not in form, to that of the algarrobo. Also called "jacana." (Hansard.)

Acanthotrichilia triacantha. See *Trichilia triacantha.*

Acayu. See *Anacardium occidentale.*

A form of the name "acaju."

Aceitillo. See *Simaruba tulae.*

A wood of this name, the locality not given, is described as strong and durable; very well suited to all kinds of coarse carpenter work where great strength is needed. (Grosourdy, **2**: 356.)

Aceitillo labrado.

A tree from the northwest part of the island; height, 35 to 40 feet (10 to 12 meters); diameter, 35 to 40 inches (87 to 100 centimeters). Wood light yellow, hard; specific gravity, 0.947; used in cabinetmaking. (Exp. 1857.) (Grosourdy, **2**: 356.)

Aceitillo liso.

A tree from the northwestern part of the island; height, 50 to 55 feet (15 to 17 meters); diameter, 35 to 40 inches (87 to 100 centimeters). Wood light yellow, hard; specific gravity, 0.789; used in making furniture. (Exp. 1857.) Grosourdy, **2**: 356.)

Aceituna. See *Symplocos martinicensis.*

A tree abundant in the eastern part of the island; height, 35 to 40 feet (10 to 12 meters); furnishing a soft, light-colored wood, breaking with an oblique fracture; suitable for framework in houses. (Grosourdy, **2**: 357.)

The European olive, *Olea europaea*, to which this name is properly applied, is not known to occur in Porto Rico.

Aceituna blanca. See *Symplocos martinicensis.*

A tree from the eastern part of the island; height, 12 to 15 feet (4 to 5 meters); diameter, 16 to 18 inches (40 to 45 centimeters). Wood white, rather hard; specific gravity, 0.646; used for weatherboards. (Exp. 1857.)

Aceituna cimarrona. See *Symplocos martinicensis.*

Aceituna macho.

A tree from the eastern part of the island; height, 35 to 40 feet (10 to 12 meters); diameter, 16 to 18 inches (40 to 45 centimeters). Wood, light-reddish, rather hard; specific gravity, 0.656; used for weatherboards. (Exp. 1857.)

Aceitunillo.

A tree reported by Captain Hansard from the northeastern part of the island; specific gravity of wood, 0.84. In Cuba this name is applied to *Aextoxicon punctatum*, a cultivated euphorbiaceous plant, native of Chile.

Achicoria de cabro. See *Erechtites hieracifolia.*

Achiote. See *Bixa orellana.*

A tree from all parts of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 8 to 9 inches (20 to 23 centimeters). Wood, white and very soft; specific gravity, 0.404; not used. (Exp. 1857.)

Achote. See *Bixa orellana.*

A shortening of Achiote, of questionable correctness.

Achras sapota. SAPODILLA. NÍSPERO.

A handsome tree belonging to the family Sapotaceae, commonly cultivated in Porto Rico and supposed to have been introduced from Venezuela. The application of the name "níspero" to this species, though erroneous and misleading to strangers, is universal in Porto Rico, and has led Mr. Hill and possibly other writers to report the loquat as abundant, the latter fruit bearing the name níspero in Spain and in Spanish lexicons.

The sapodilla tree grows to a height of 25 or 30 feet (7 to 9 meters) and has shining dark green leaves. The fruit is somewhat larger than a hen's egg, with a rather rough, brownish skin, suggesting an Irish potato with earth adhering. It has a yellowish pulp and 4 or 5 black seeds. The wood is said to be soft, although Captain Hansard gives the specific gravity as 1.02. This tree furnishes the material imported in recent years in large quantities from Mexico under the name of "chicle," or "gum chicle," and used mostly in the manufacture of chewing gum. It is obtained by the evaporation of the milky juice secured by tapping the trees or by pressure from the fruit.

The sapodilla is one of the tropical fruits which, like the mango and avocado pear, may have a future in the American market. Experiments have been made by the Division of Pomology with sapodillas raised on the Florida Keys and they were found, contrary to expectations, to stand shipment well. The skin, while not thick or hard, does not seem particularly susceptible to decay, and it is believed that with proper care in harvesting and packing sapodillas could be kept in good condition for ten days or two weeks, to say nothing of the possibilities of cold storage. The fruit is also believed by some of the fruit experts to be one which is likely to become popular if it can be furnished in sufficient quantities to give it a regular place in the market.

The question of varieties of sapodillas has not received attention as yet, but should be given careful consideration if planting for export is undertaken. The testimony of travelers in Mexico and other countries where the fruit abounds, indicates that the natural differences in quality between the unselected seedlings are very appreciable so that a search for superior varieties might be richly repaid.

The fact that in the culture of the sapodilla the production of "chicle" could be made an alternative resource, when the fruit could not be properly marketed, would give the industry an advantage over many lines of fruit growing.

Grosourdy describes this tree as furnishing a very good wood, of good weight, more than ordinarily hard, compact in texture, and fine-grained. The color is light red with darker stripes. It is as strong and as good as "balata" or "pargo" and might replace these if it grew wild and was more abundant. Specific gravity, 1.021. (Grosourdy, 2: 413.)

Bello gives "ausubo" as the common name of a synonym of this species.

Acisanthera quadrata. CAMACEY DE CHARCOS.

Family Melastomaceae; a slender, somewhat woody herb growing in sandy overflowed situations. (Stahl, 4: 119.)

Acnistus arborescens. GALAN ARBOREO.

Family Solanaceae; a shrub or low tree, smooth, and much branched; grows in waste places and mountainous localities to an altitude of 500 feet (155 meters) or more; flowers in March. (Stahl, 4: 142.)

Grosourdy gives "palo de gallina" as the common name of this tree and describes it as a wild tree from Porto Rico, Trinidad, and as far as Caracas, 15 to 25 feet high (5 to 8 meters), with a trunk 4 to 6 inches (10 to 15 centimeters) in diameter. It furnishes a soft wood, dirty white in color, that breaks with a vertical fracture. Its most common uses are as fuel and for the framework of rude houses. He states that the common name is derived from the fact that the fruit kills chickens if eaten by them. (Grosourdy, 2: 406.)

Acrista monticola. PALMA DE SIERRA.

Family Arecaceae; among the mountains between Cayey and Guayama many summits are covered with the palma de sierra, probably in places which have never been cleared. A few of the palms follow down the steeper uncultivated ravines. From a distance the crowns suggest royal palms, but a closer view renders the difference apparent. There is also no suggestion of the bulging trunk of Roystonea. In height the palma de sierra probably does not exceed the royal palm.

Acrocomia. COROZO PALM.

A genus of palms distributed through tropical America from Mexico and Cuba to Paraguay. All the species are of stocky, compact growth with a dense crown of numerous leaves. The trunk as well as the leaf stalks is usually armed with sharp spines, sometimes several inches long.

The economic value of Acrocomia lies mostly in the nut-like seeds, an inch or more in diameter, which are constructed on the principle of the cocoanut. The outer fibrous husk is oily and edible in some species, and there is a nearly solid kernel, from which oil is extracted for food as well as for soap making and other purposes for which the cocoanut and African oil palm are used. In Paraguay the collection of palm kernels from a species of Acrocomia has become a considerable industry and large quantities are exported to Europe. In order to free the nuts from the fibrous husk they are fed to cattle, after which they are cracked. The Porto Rican species has larger seeds than the Paraguayan and the husks are not known to be edible. The natives seem also to make little use of the meat except to eat it occasionally before fully ripe, when it tastes much like cocoanut. While the kernels, if extracted, could probably be marketed, it is possible that the labor required could find better remuneration in other work, though the subject might be worthy of investigation in districts where the palms are abundant.

The outer shell of the trunk of the corozo palm is extremely hard, but seems to be used in Porto Rico only for the manufacture of walking sticks. When well made these are both curious and beautiful. The general color is a deep rich reddish brown, irregularly nerved with the lighter color of the compacted fibrous strands.

From the leaves of Acrocomia a fiber of great strength and fineness has been obtained in some of the British West Indies, but it seems not to have been applied to any civilized purpose or to have become a regular article of commerce.

Acrocomia aculeata.

A species from Martinique, referred by Martius to *A. sclerocarpa*. It has not been noticed in Porto Rico.

Acrocomia media. COROZO.

Although totally different on close inspection this palm has a superficial resemblance to the royal palm, which often deceives travelers. The similarity lies mostly in the two facts that both the royal and "corozo" palms are more robust and stiffly erect than the cocoanut, and that the leaf divisions instead of lying horizontal and in one plane are tilted at different angles to the midrib, thus giving the foliage seen in the mass a somewhat unkempt appearance in comparison with the cocoanut.

In distinguishing the corozo palm from the royal palm when seen at a distance so great that the spines of the one and the columnar green leaf sheaths of the other can not be seen, recourse may be had to the following facts. The leaf crown of the corozo palm is much rounder, thicker, and more compact than that of the royal palm, since it contains many more leaves, and these persist much longer. The royal palm can also be known by the unopened leaves which project straight upward like flag poles or lightning rods, while in Acrocomia the leaves open as they are pushed out and seldom offer a suggestion of the spire-like effect.

Adansonia digitata.

Family Bombacaceae; the African baobab tree has been introduced into gardens in the West Indies, but is not known to have become naturalized.

Adelfa. See *Nerium oleander.*

Adelfa sencilla. See *Nerium oleander.*

The name means single oleander.

Adenanthera pavonina. PALO DE PERONIAS.

Also called "coralitos;" a leguminous tree, 5 meters high, introduced from India as an ornamental, and naturalized in some localities. (Stahl, **3**: 135.)

Grosourdy gives the common name "coral," and describes it as a wild tree of the hills, 30 or 40 feet (9 to 12 meters) high, 12 to 14 inches (30 to 35 centimeters) in diameter, furnishing a rather strong reddish wood. Used for beams and boards of country houses and frequently turned. It also serves as a dyestuff. (Grosourdy, **2**: 377.)

Adiantum fragile.

Sold in the market at Ponce for making an infusion used in diseases of women.

Aegiphila martinicensis. CAPAILLO.

Family Verbenaceae; a smooth shrub growing in thickets in the foothills; flowering in summer and autumn. (Stahl, **6**: 222.) Reported from Yabucao. (Sintenis.)

Aeria attenuata. LLUME.

Family Arecaceae; the so-called "llume" palm is a most striking ornament of the rugged limestone hills from Vega Baja to Manati and Arecibo. At a sufficient distance the slender trunk is no longer visible and the crown of leaves appears as if suspended in mid-air, while at closer range it does not seem possible that so slender a shaft can maintain itself. This very slenderness, with the attending flexibility, is, however, an element of strength, since it permits the trees to bend before the wind while the leaves diminish the resistance by straightening out as in the cocoanut. The hurricane of August, 1899, seemed to have done little damage to these tallest of Porto Rico palms, many of which project for more than half their height above everything standing about them. As the trees of the rather sparse forest growth of these hills are commonly from 12 to 18 meters tall, the llume palms must often attain upwards of 30 meters.

Aeschynomene americana. YERBA ROSARIO.

A leguminous shrubby herb affecting roadsides and dry localities, flowering in autumn. The pod has but 5 to 8 joints, instead of 9 to 15 as in *A. sensitiva.* Our specimens were obtained at Carolina and Cayey.

Aeschynomene portoricensis.

A new species, named by Urban, from the shores of Lake Tortugero near Manati.

Aeschynomene sensitiva. YERBA ROSARIO.

An herb or biennial shrub growing in localities subject to inundation; flowers in August. (Stahl, **3**: 37.)

Agati grandiflora. GALLITO.

A small, ornamental, leguminous tree, or large shrub, 3 to 5 meters high, said by Stahl to be a biennial. The large pendulous flowers are either white or pink. At Coamo Springs this was called "baculo." A native of India, cultivated in gardens. (Stahl, **3**: 33.)

Agave.

Agaves or century plants are not uncommon in Porto Rico, and are plentiful on the dry hillsides near Guayanilla. What appeared to be several distinct species were observed, but specific determinations are so difficult and uncertain in this group that no attempt was made to classify them.

In the Ponce market pieces of the stems in the form of flat sticks about 10 inches long were on sale for use as razor strops.

Agave sisalana. SISAL HEMP.

Among the suggestions made for new cultures is that of sisal hemp. This is the product of an agave or century plant, and is now largely imported from Mexico. It is, however, improbable that any large area of Porto Rico could be profitably devoted to growing this plant, the culture of which finds a place in land which is too dry and rocky for ordinary crops, and is consequently of so little value that it can be given up to a rather slow-growing plant like the agave. Three or four years are required before the cutting of the leaves and the extraction of the fiber may be begun, and the business can be carried on to the best advantage when estates are large, those of Yucatan being from 500 to 20,000 acres or more in extent. It would be difficult to secure such tracts of suitable land in Porto Rico, especially at prices which would justify attempting the establishment of this industry. In the southwestern part of the island, between Ponce and Yauco, there is some unused rocky land which might produce sisal hemp. However, it is doubtful whether any land suitable even for the rough cultivations sufficing for this plant could not be more profitably employed for other purposes. Most of the island is certainly too valuable to be planted to agaves, and, on the other hand, these will not produce fiber in paying quantities in rich or moist soil.

Ageratum conyzoides. MENTRASTO.

An annual composite herb cultivated as a flower. (Stahl. 5: 110.)

Agitacalillo.

A wood known to Captain Hansard; specific gravity 0.79.

Agrio de guinea. See *Hibiscus sabdariffa*.

Agripalma. See *Leonurus sibiricus*.

Aguacate. See *Persea gratissima*.

Aguacatillo. See *Meliosma obtusifolia* and *M. herbertii*.

A tree from all parts of the island; height, 80 to 90 feet (24 to 27 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood white and soft; specific gravity 0.632; little used. (Exp. 1857.)

Aguardiente.

A general name for spirituous liquors; not so much used in Porto Rico as in some Spanish countries, "ron" (rum) being much more common.

Aguinaldo.

This name was applied at Cataño to a large lavender-flowered ornamental species of Solanum, perhaps *S. seaforthianum* (no. 972).

Aguinaldo amarillo. See *Ipomoea umbellata*.

Aguinaldo azul. See *Convolvulus pentanthus*.

Aguinaldo blanco. See *Convolvulus nodiflorus*.

Aguinaldo blanco de costa. See *Convolvulus jamaicensis*.

Aguinaldo peludo. See *Jacquemontia tamnifolia*.

Ahorca caballo. See *Heteropteris bellonis*.

Aiphanes.

A genus of palms recently described from South America, and reduced by Martius to a synonym of Martinezia, one species of which, *Martinezia corallina*, comes from Martinique and may prove to be rather closely related to the coyure palm of Porto Rico. On finding that the genus Martinezia could not include the Porto Rican species, the use of Aiphanes was considered, with a negative conclusion, the reasons for which appear below:

The genus Aiphanes was established by Willdenow on *A. aculeata*, a spiny palm from the mountains about Caracas. The trunk is said to be erect, 30 feet (9 meters) high, subcylindrical, and very spiny. The fronds are about 5 feet long, with four pairs of remote, broad, cuneate, praemorse pinnae, strongly whitish-pubescent on the under side. The petiole is also beset with spines. Spathe acuminate at both ends, aculeate on the outside, smooth within, opening longitudinally; spadix 1½ feet (45 centimeters) long, composed of cylindrical spikes placed opposite. Flowers hermaphrodite; calyx trifid, its divisions acute; petals acuminate; filaments 6, subulate; anthers rounded; style as long as the stamens; stigma trifid. Drupe globose, the fleshy farinaceous pulp rather tasteless, though edible; nut hard, of the size of a musket ball, unilocular, black, furrowed with a large number of greyish grooves, of which three are always much larger than the others; the kernel is white, very sweet, and very good to eat.

Aiphanes grows in the ravines and forests of the high mountains of the district of Caucagua, province of Caracas, Venezuela, and requires a fertile, somewhat moist soil. It flowers and fruits in July.

From the above it appears that Aiphanes is a genus quite different from that of the spiny palm collected at Vega Baja, and it seems to approach some of the South American forms described under Bactris much more closely than it resembles the Porto Rican tree.

Aipim. See *Manihot palmata.*

Ajenjo cimarron. See *Parthenium hysterophorus.*

Ají. See *Capsicum.*

A general name for red peppers, a favorite condiment and vegetable in Spanish countries. Numerous varieties are known and distinguished by common names in Mexico and Cuba, but the subject has not yet received attention in Porto Rico. The large "sweet" peppers are called "aji dulce" in Porto Rico, and belong to the botanical species *Capsicum annuum*, while the small, more pungent varieties belong to *C. frutescens.*

Ají caballero.

Near Toa Alta this name was used for a species of Capsicum supposed to be *C. frutescens.* (No. 894.)

Ají dulce. See *Capsicum annuum.*

The Spanish name for the large "sweet" peppers.

Ají picante. See *Capsicum.*

"Pungent peppers" are mostly small varieties of *Capsicum frutescens* or *C. baccatum.*

Ajo. See *Allium sativum.*

Ajonjolí. See *Sesamum orientale.*

Akee. See *Blighia sapida.*

Alambrillo. See *Rajania cordata.*

This is the Cuban name of this plant; the Porto Rican designation is unknown.

Albahaca. See *Ocimum basilicum.*

Also applied at Rio Piedras to a Scutellaria, probably *S. pilosa* or *S. coerulea.*

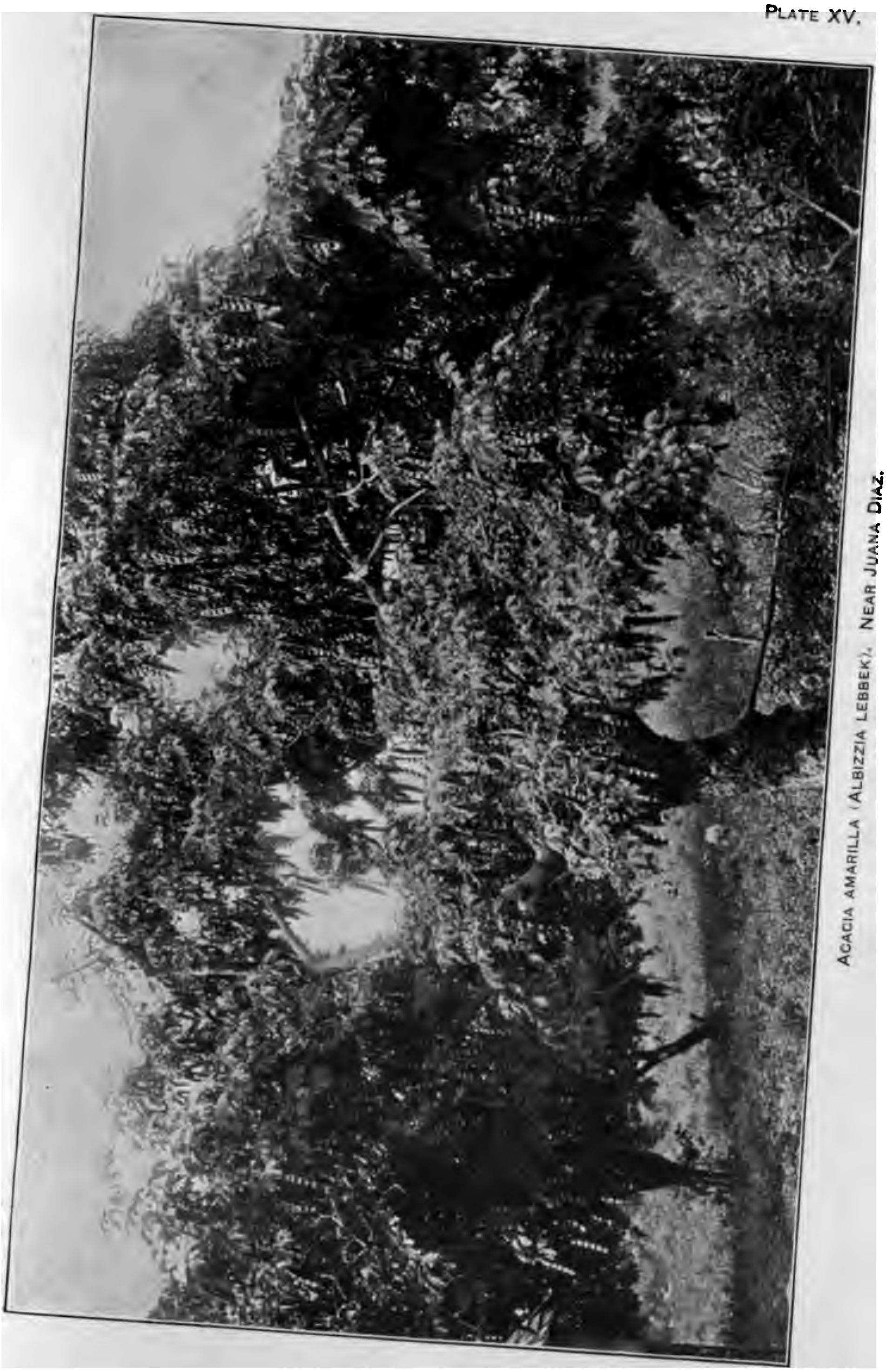
Albahaca cimarrona. See *Ocimum micranthum* and *O. americanum.*

Albizzia lebbek. ACACIA AMARILLA. PLATE XV.

A beautiful leguminous shade tree, native in the East Indies, but now extensively introduced in tropical and semitropical countries. It endures drought and thrives in rocky limestone soils, and would thus appear to be well fitted for the south side of Porto Rico, where it already exists in small numbers, as well as at Mayaguez and San Juan.

Alcachofa. See *Cynara scolymus.*

PLATE XV.



ACACIA AMARILLA (ALBIZZIA LEBBEK). NEAR JUANA DIAZ.

Alchornea latifolia.

Family Euphorbiaceae; known from Lares and Peñuelas. (Sintenis.)

Alchorneopsis portoricensis. PALO DE GALLINA.

A euphorbiaceous tree of 10 to 15 meters, known only from the Sierra Luquillo.

Alder, West Indian. See *Conocarpus erecta.*

Alectra brasiliensis. YERBA DE HIERRO.

Family Scrophulariaceae; a herbaceous annual, growing in ditches and inundated places. (Stahl, **6**: 228.)

Alelí. See *Plumeria rubra.*

Alelí amarillo. See *Plumeria tenorii.*

Alelí cimarron. See *Plumeria obtusa, P. portoricensis*, and *P. alba.*

Aleluya roja de Guinea. See *Hibiscus sabdariffa.*

The name signifies red sorrel of Guinea.

Alfalfa. See *Medicago sativa.*

Algalia. See *Abelmoschus abelmoschus.*

Algarrobo. See *Hymenaea courbaril.*

According to Stahl this name is applied only to *Hymenaea courbaril*, while Hill states that it is also used for *Pithecolobium saman*. The true "algarrobo" or "carob" of southern Europe is *Ceratonia siliqua*, "St. John's bread," the pods of which are valuable as fodder. Captain Hansard gives the specific gravity of "algarrobo" as 1.06, and believes the tree to be indigenous since large trees are found in the mountains in apparently undisturbed forests. He states that it is used especially for wagon wheels, and also believes that it is the same as the "carob" or "gum animae" of the British Islands.

Algarrobo amarillo. See *Hymenaea courbaril.*

This variety is described as a very beautiful tree, large and robust, reaching 90 feet (27 meters) in height and with a straight trunk 24 to 30 feet (7 to 9 meters) long, with a diameter of 6 feet (1.8 meters), or sometimes much more. Martius is said to have seen Algarroba trees in Brazil whose circumference was such that it took 15 Indians with arms extended to encompass one of them. The wood is very hard, yellowish with green veins, breaking vertically. The grain is fine and dense. The wood is much appreciated as well for its strength and durability as for its beauty. Specific gravity, 0.929. It is utilized for all sorts of fine carpenter and cabinet work. It constitutes an important branch of the exports to Europe, where it is much appreciated for fine furniture. In the Antilles it is used commonly in the making of sugar mills, whose cylinders and cogs are made of this material. It is, in fact, one of the best woods of the country and one of the most used. (Grosourdy, **2**: 359.)

Reported from all parts of the island; specific gravity, 0.592. (Exp. 1857.)

Algarrobo colorado. See *Hymenaea courbaril.*

According to Grosourdy (**2**: 360), this is a variety differing from Algarrobo amarillo in having its wood rather light reddish brown, with much darker veins of varying sizes; susceptible also of a high polish. Used for the same purposes as the other.

In the list of woods at the exposition in 1857 this variety is described as a tree 40 to 50 feet (12 to 15 meters) high, from all parts of the island; specific gravity, 0.784.

Algodon. See *Gossypium.*

"Algodon" is the Spanish for cotton, and is applied not only to the genuine cotton but to other related or similar species, as below:

Algodon de seda. See *Calotropis procera.*

Algodon de yuca. See *Gossypium janiphaefolium.*

Algodon rojo. See *Gossypium barbadense.*

Said to be the variety which has been described botanically as *Gossypium purpurascens.*

Algodon yuca. See *Gossypium barbadense.*

Said by Maza to be the variety described by Bello as *Gossypium janiphaefolium.*

Algodoncillo. See *Anguria plumieriana* and *Asclepias curassavica.*

Alilaila.

A tree from all parts of the island; height, 35 to 40 feet (11 or 12 meters); diameter, 5 to 6 inches (12 to 15 centimeters). Wood pinkish, rather hard: specific gravity, 0.803; used in making agricultural implements. (Exp. 1857.) This is probably the same as "lilaila," a name applied to *Melia azedarach.*

Aljonjolí. See *Sesamum orientale.*

Allamanda cathartica. CANARIO.

Family Apocynaceae; an ornamental shrub or small tree introduced from South America. (Stahl, **6**: 67.)

Alligator apple. See *Anona palustris.*

Alligator pear. See *Persea gratissima.*

Allium cepa. ONION. CEBOLLA.

Onions are occasionally cultivated in gardens, but the market supply is imported. An American correspondent states that only the Bermuda variety does well. The growing of Bermuda onions is one of the openings suggested for export gardening in Porto Rico and commercial experiments will probably be tried. The seed from Bermuda onions is all grown in Teneriffe.

Allium sativum. GARLIC. AJO.

Allophylus occidentalis. QUIEBRA HACHAS.

An indigenous tree of the family Sapindaceae. (Stahl, **2**: 159, as *Schmidelia occidentalis.*)

Alloplectus ambiguus.

Family Gesneriaceae; a new species to replace the *Alloplectus cristatus*, which does not represent the genuine species of that name. Two varieties, *chlorosepalus* and *erythrosepalus*, are also named and reported from numerous localities. (Urban, Symb. **1**: 408.)

Alloplectus cristatus. TIBEY DE CRESTA.

Family Gesneriaceae; a rather fleshy herb covered with a reddish pubescence; grows adhering to rocks in the higher mountains, flowering in summer. Urban includes this under his *A. ambiguus.* (Stahl, **6**: 261.)

Allspice.

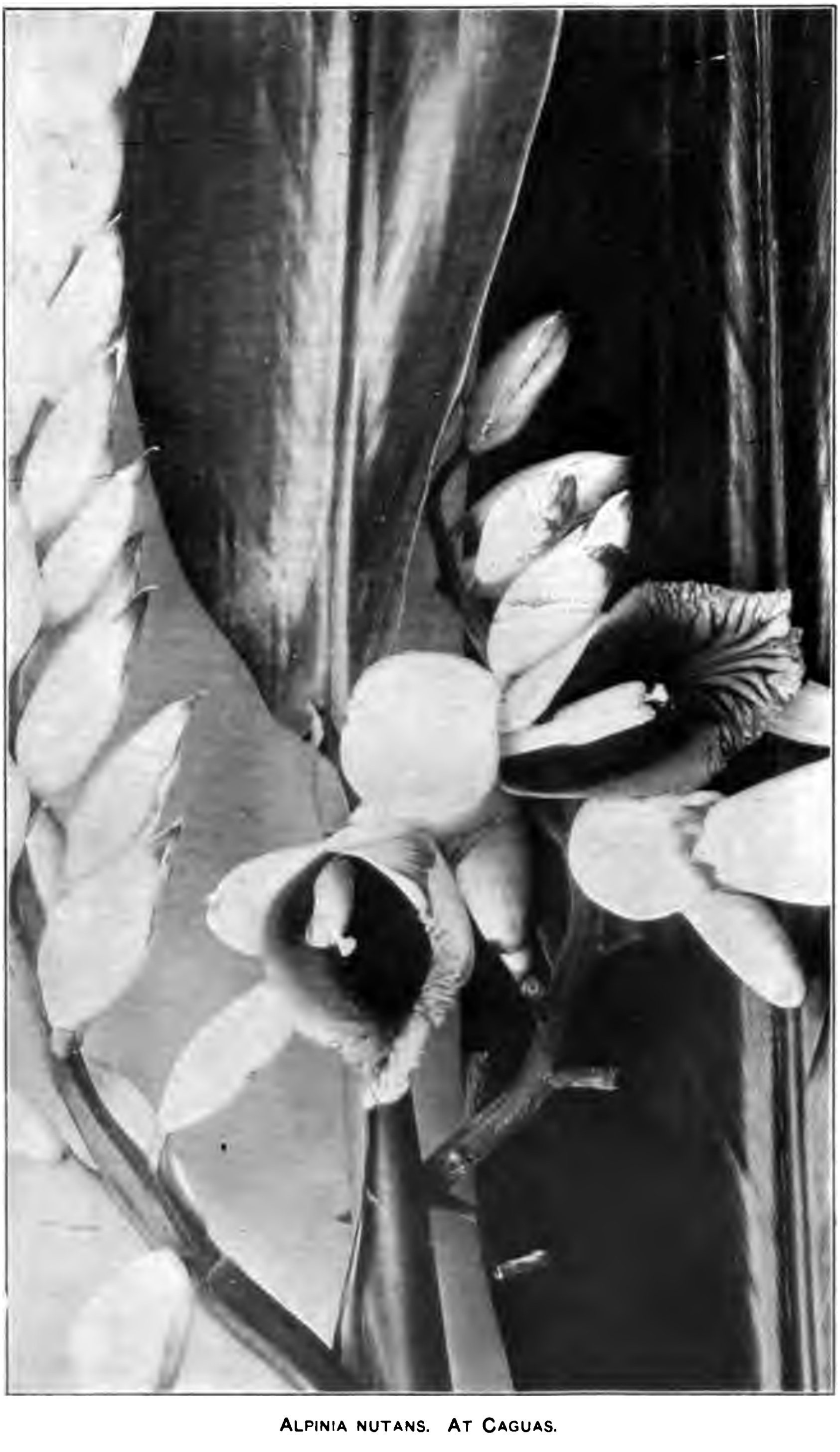
The occurrence of the true allspice, *Pimenta officinalis*, in Porto Rico has not been established, and the reports of Hill and others are probably to be taken as applying to *Amomis caryophyllata*, the tree yielding the oil of bay used in compounding bay rum.

Almacigo. See *Bursera simaruba.*

In Spain this name is applied to the true mastic tree, *Pistacia lentiscus.*

Almacigo blanco.

A tree from all parts of the island; height, 45 to 50 feet (14 to 15 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood light-colored, soft; specific gravity, 0.271; not used. (Exp. 1857.)



ALPINIA NUTANS. AT CAGUAS.

Almacigo rojo.

A tree from all parts of the island; height, 10 to 12 feet (3 to 4 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood pinkish, soft; specific gravity, 0.274; not used. (Exp. 1857.)

Almendra.

The fruit of *Terminalia catappa.*

Almendrillo. See *Prunus occidentalis.*

A tree from all parts of the island; height, 35 to 40 feet (11 to 13 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood light-colored, rather hard; specific gravity, 0.742; not used. (Exp. 1857.)

Almendro. See *Terminalia catappa.*

In Cuba this name is applied to several species of Haemocharis, handsome trees of the tea family, Theaceae. In Porto Rico, however, it seems that "almendro" and "almendron" both refer to *Terminalia catappa*, although the account of the collection of Porto Rican woods of the exposition of 1857 gives different data under "almendro" and "almendron."

A tree from all parts of the island; height, 40 to 50 feet (13 to 15 meters); diameter, 20 to 22 inches (50 to 55 centimeters). Wood light-colored, rather hard; specific gravity, 0.644; little used. (Exp. 1857.)

Almendrón. See *Terminalia catappa.*

A tree from the southern part of the island; height, 45 to 50 feet (14 to 15 meters); diameter. 12 to 15 inches (30 to 37 centimeters). Wood cinnamon-color, hard; specific gravity, 0.922; used in cabinetmaking. (Exp. 1857.)

According to Bello the name "almendron" is also applied to *Prunus occidentalis.*

Almidon.

The Spanish word for starch, in the West Indies commonly made from "cassava" (*Manihot utilissima*).

Almond.

The true almond, *Amygdalus amygdalus*, is closely related to the peach, and does not grow in Porto Rico, but the name "almendron" is applied instead to *Terminalia catappa*, the fruit of which is called "almendra" and is commonly believed to be the genuine article.

Aloe.

This name is sometimes incorrectly applied to the various species of Agave or "century plants," which are native of Mexico, South America, and the West Indies. The genus Aloe belongs to the Liliaceae and is of African origin. Some of the species have been introduced into cultivation, and *Aloe vera* in particular is now widely spread throughout the more arid tropical and subtropical regions. As early as 1596 specimens were taken to England from Barbados and the plant was long supposed to be native in that island, receiving the name *Aloe barbadensis.* It is also naturalized, according to Grisebach, in Jamaica, Antigua, and St. Vincent, and very probably in Porto Rico, although not yet reported.

Aloe-wood. See *Cordia sebestena.*

Alpinia nutans. PLATE XVI.

Family Zingiberaceae; native in East Indies, but now widely cultivated for the beauty of its flowers: apparently naturalized in Porto Rico. Collected near Bayamon by Sintenis. Our specimen was obtained near Cayey.

Altea. See *Nepsera aquatica.*

Alternanthera repens. ARDOSNA JARDIN.

Family Amarantaceae; specimens from Cataño (no. 989). The flowers are straw-colored.

Alysicarpus vaginalis. YERBA DE CONTRABANDO.

A small creeping, shrubby leguminous plant with single leaflets and clusters of subcylindrical pods breaking up into single sections, of which the outer surface is irregularly reticulate. Reported from a single station, Boca Vieja, near the mouth of the Bayamon River. Our specimens were obtained in two localities near Ponce. (Stahl, **3**: 158.)

Amaranthus paniculatus. PIGWEED. BLEDO BLANCO.

Collected by Sintenis at Guanica.

Amaranthus tristis. PIGWEED.

A common pigweed very similar to our well-known garden pest, *Amaranthus retroflexus.*

Ambrosia. ARTEMISA.

A specimen of Ambrosia (no. 966) collected at Cataño appears to be the same as Sintenis no. 196b, from Bayamon, but a specific identification has not been made.

American nutmeg. See *Monodora myristica.*

Ammannia humilis. YERBA DE CANCER.

Family Lythraceae; this species and *A. latifolia* share the common name and are annual herbs growing in ditches and overflowed places. *A. coccinea*, variety *purpurea*, is reported from Guanica. (Stahl, **4**: 128.)

Amor sin zelo.

An ornamental apocynaceous plant, evidently closely related to Allamanda, and having similar large yellow flowers, but not yet identified.

Amphilophium paniculatum. LIANA DE CUELLO.

Family Bignoniaceae; a hexagonal vine, scaly-pubescent and much branched; it is found both near the sea and in the mountains; flowers in winter. (Stahl, **6**: 182.)

Amomis caryophyllata. BAYBERRY TREE. BAY RUM TREE. WILD CINNAMON. AUSU.

Variously reported by Bello, Krug, Stahl, and Sintenis as "ausu," "auzu," "guayavita," "limoncillo," "malagueta," and "pimienta malagueta." A myrtaceous tree, from the dried leaves of which is obtained by distillation with water an essential oil, called "bay oil" or "oil of bay," the most important ingredient of bay rum. Only a pint and a half of oil is said to be required for the medication of 100 gallons of rum. The latter should be of good quality and strength. If below 18 or 19 proof it will not properly incorporate the oil. Large quantities of dried leaves of this species are imported from the West Indies, notably from the island of Dominica. They are generally put up into bales of about 200 pounds in weight. It is not known that any leaves have been shipped from Porto Rico, but in 1895, 95 gallons of bay oil, valued at $1,390, and 12,544 gallons of bay rum, valued at $6,414, were exported. The trees occur in all parts of the island and are said to be abundant in some districts on the south side. The industry is worthy of investigation as one probably capable of profitable expansion, although not likely to become of more than minor and local importance.

In the fresh condition the leaves of this tree have the taste and odor of lemon, whence the propriety of the name "limoncillo" or "little lemon." Although more common in Porto Rico as a shrub, this species is said to grow to a height of 35 or 40 feet (11 or 12 meters) and to attain a diameter of a foot (30 centimeters) or more; the wood is light-colored, mottled, very hard and heavy. Captain Hansard reports that the tree is cultivated at Maunabo and at other points for the sake of the leaves.

There are probably several other myrtaceous trees which share with this the name "pimiento," but the present is probably that which Hill and others have supposed to be allspice. (Stahl, 4: 72.)

A tree 45 to 50 feet (14 to 16 meters) high, the straight, rather long trunk 15 to 24 inches (35 to 55 centimeters) in diameter. Furnishes a moderately hard and heavy wood, fine and compact in texture. The sapwood is very light red with darker lines, while the heart is brownish red, brown, or on account of the knots, almost black. It is susceptible of a very high polish. Specific gravity, 0.909. It is one of the best and most valued woods of these countries, very strong and durable, suitable for carpenters and cabinetwork, and it is exported to some extent. The bark is rough and ash-colored, and peels after the manner of the sycamore. (Grosourdy, 2: 398.)

Amyris balsamifera. ROSEWOOD.

A rutaceous shrub or small tree of 2 to 8 meters. Extends from Florida to Cuba, Jamaica, and South America. Known in Porto Rico only from the vicinity of Guanica. (Urban, Add. 3: 292.)

Amyris elemifera. TORCHWOOD. CUABILLA.

A rutaceous shrub or small tree, 2 to 8 meters in height, extending from Florida to Trinidad and known in Porto Rico in littoral thickets near Bayamon and Ponce. Native names are as yet unknown, and the above are from Florida and Cuba.

Amyris maritima. TÉA.

A shrub or small tree from 5 to 10 meters in height, growing in thickets near the sea; Cangrejos, Fajardo, Coamo, Ponce, Guanica, and Salinas de Cabo Rojo. (Urban, Add. 3: 292.)

Amyris silvatica. TÉA.

A wild tree whose height reaches 25 or 30 feet (8 or 9 meters) and the diameter of its trunk 5 to 8 inches (12 to 20 centimeters). Furnishes an aromatic wood, strong, solid, whitish in color, breaking with a vertical fracture.

On account of its resinous quality, splinters of this wood are used by the country people as torches for fishing and to light their huts. It is also suitable for furniture. (Grosourdy, 2: 379.)

Anacagüitas. See *Sterculia carthaginensis.*

Anacahuita.

Probably the same as "anacagüitas."

In Cuba a Mexican boraginaceous tree, *Cordia boissieri*, is known by this name, and the wood, yielding an oil supposed to be a specific for consumption, was formerly exported to Europe from Mexico, but experiments in Germany failed to show the presence of any medicinal virtues.

Flowers called by this name were sold in the market of Ponce for making a tea for colds, etc.

Anacardium occidentale. CASHEW. PAJUIL.

There is also a considerable variety of common names, such as "cajou," "acaju," and "marañón."

This tropical tree gives its name to the family Anacardiaceae, to which our poison ivy and sumac also belong. It is a handsome, quick-growing species, and bears fruit while still very young, sometimes when but two years old. Ultimately it reaches a height of 30 or 40 feet (9 to 13 meters) and has a close-grained, strong, and durable wood, useful for boat building and other purposes, and said to weigh 38 lbs. per cubic foot. It has large, entire oval leaves, not at all resembling those of its relatives mentioned above, but it shares with the poison ivy the possession of an acrid substance strongly irritant to the human epidermis and the mucous membranes. The poisonous material is not, however, spread through the plant, but is mostly concentrated in the rather soft shell of the nut, which is borne upon a pear-shaped, red or yellow fleshy receptacle 2 to 4 inches (5 to 10 centimeters) long.

This receptacle is edible and quite harmless when ripe, having a very agreeable, subacid taste in the raw state, and being also stewed or cooked; a distilled liquor, said to be of good quality, has also been made from it, and in Porto Rico it is used as an ingredient of a peculiar beverage which has been compared to punch. The nut is comparable in size to a rather thick peanut, is kidney-shaped, or distinctly curved near the middle, and contains a single large kernel of white, firm flesh of fine texture and a delicate, very pleasant, nutty flavor. No attempt should, however, be made to eat it in the raw state, on account of the poisonous juice of the shell, which must be driven off by the heat, so that roasting is an absolute necessity. In the fresh state the kernel also contains a slight amount of the irritant oil and has painful effects upon the lips and tongue.

The process of roasting the nuts is quite simple, but skill and experience are required to avoid burning on the one hand and insufficient heating on the other. The fumes driven off during the operation are also poisonous, and where cashew nuts are roasted in large quantities for export the workers suffer from blistered faces and hands, accompanied by painful swellings and other toxic effects of inhaling and coming in contact with the poisonous vapors. These difficulties might be obviated, it would seem, by a proper arrangement of the roasting ovens and by providing a system of drafts for carrying up the fumes.

After the roasting is completed the nuts are shelled and sorted and packed in sealed tin cans for shipment. In this way they keep fresh for a considerable period without the necessity of any other preliminary treatment or of the addition of preservatives. The trade in cashew nuts is still very small, but may be expected to increase. Mr. David G. Fairchild, agricultural explorer of the United States Department of Agriculture, became acquainted with the cashew in Jamaica and took a very enthusiastic view of its value and commercial possibilities, as the following extract from a letter will show:

"I assure you that there is no nut so delicious as the roasted cashew. Burnt almonds are flat in comparison. Huyler could, I believe, make a fine thing of it, and a big market could be created. Through William Fawcett, director of the gardens here, you can secure a large quantity of seeds for planting, I believe. The sooner groves are started the sooner the nuts can be pushed on the market. For Porto Rico and Hawaii, I believe, it would be a good thing. This fruit is bound to go. Porto Rico, Cuba, and Hawaii should be encouraged and steps be taken to secure a collection of the best varieties. Look out for Jamaica as a competitor. Mr. S. T. Scharschmidt, of Mandeville, Jamaica, has made an oil from the fruit, superior to olive oil for table use. There are wonderful prospects for such a fruit. It can be shipped to Boston from here easily without cold storage."

From a sample sent home the roasted nuts were pronounced excellent by all who tasted them. Probably they are better when fresh, though no tendency to become rancid was apparent. In British India the cashew has now been introduced very generally, and has found a much larger variety of uses than in its native home in the West Indies and South America. East Indian information has been compiled from numerous sources in Watt's Economic Products of India, and is, with the omission of some repetitions, as follows:

"The bark of this plant yields a gum which occurs in large stalactitic pieces; it is yellow or reddish, and only slightly soluble in water. It is obnoxious to insects. The astringent juice issuing from injections in the bark is in demand as an ink, and is used by native workmen as a flux for soldering metals. The bark may be used for tanning. The pericarp gives an oil called cardol, which is very astringent, and is used by the Andamanese to tan or color fishing nets, so as to preserve them. Dr. Dymock informs me that this oil is called dik in Goa, where it is much used as a tar for boats and nets.

"From this plant two distinct oils are obtained. (1) The kernels when pressed yield a light-yellow bland oil, very nutritious, the finest quality in every respect, equal to almond oil and considered superior to olive oil. The yield is about 40 per cent. The kernels are so extensively eaten in India, however, that it is almost impossible that a trade could at present be done in this oil. Samples of this fixed oil, and information as to methods of preparation and extent of trade, are much required. The kernels have been once or twice exported to Europe under the name of 'cassia nuts.'

"(2) *Cardole or Cashew-apple oil.*—This is prepared from the pericarp or shell of the nut. It is black, acrid, and powerfully vesicating. In the Andamans it is used to color and preserve fishing lines. It is an effective preventive against white ants in carved woodwork, books, etc. The yield is 29½ per cent.

"The medicinal uses of this plant are many. The acrid oil is used as an anaesthetic in leprosy, and as a blister in warts, corns, and ulcers. Between the laminae of the shell of the kernel there is a black caustic fluid, which contains an acrid oily principle, cardol, and a peculiar acid, anacardic acid. It possesses powerful rubefacient and vesicant properties. The spirit distilled from the expressed juices of the fruit may be used as a stimulant. Fruit eaten as a remedy for scurvy. The juice of the nut is used as a substitute for iodine locally. The oil I have used with benefit in the anaesthetic variety of leprosy. The oil obtained from the shell by maceration in spirit is the very best application for cracks of the feet so common with natives. The oil is efficacious, when faintly brushed, as a local stimulant in psoriasis."

Along the Adjuntas road we noticed trees of Anacardium from which the bark of the trunk had been largely hacked off. On inquiring it was learned that a decoction made of it was held in high esteem as an astringent remedy for diarrhea.

In the bulletins of the botanic gardens of Jamaica and Trinidad this tree has also received attention, and some additional notes from these sources are appended:

"A gum is obtained from the trunk. It is subastringent and highly unpalatable to insects. It consists principally of arabine and dextrine, both soluble in water, with a minor insoluble portion, probably bassarine. It forms a strong, yellowish mucilage with water. In South America it is largely used by bookbinders; it is occasionally imported from that country into England and possesses the same commercial value as the common and inferior sorts of Arabic and Senegal gums.

"The fruit of Anacardium is well known to West Indians, who, besides eating it in the fresh state, make conserves of it in various ways. Though sweet, it is at the same time very astringent and said to be useful in cases of dysentery and diarrhea. Many and various are the effects with which this tree, its fruit, bark, leaves, and seeds are credited, and if all were true, it would indeed be one of the wonders of nature. It is said to possess aphrodisiacal properties, the leaves to be capable of producing drunkenness, the nuts or seeds when roasted to excite the faculties, especially memory, so much so that a confection made therefrom has been called 'confection des sages,' and the oil from the nut is said to be equal to that made from the finest olives, while an acrid oil is produced from the epidermis of the nut, which is said by Barham in Hortus Americanus, 1794, to 'cure herpes and cancerous and malignant ulcers abounding in rotten flesh; it also kills worms in ulcers and chigoes; it takes away freckles and liver spots, but it draws blisters and therefore must be cautiously made use of. It has been observed that poor dropsical slaves that have had the liberty to go into a cashew walk and eat what cashews they pleased, and of the roasted nuts, have been recovered.'"

Another writer brings an indictment against the West Indian fair sex for using it as a cosmetic when they have become tanned by exposure to the sun. He describes the process as follows:

"They take a nut, scrape off the outside skin, and rub their faces with the exposed oily surface. The face swells and blackens, but ultimately the tan skin peels off; and although the process necessitates rigid retirement for a fortnight, at the end of that time they emerge with a new skin and complexion as fair as a babe. It is also to be stated that the oil is found to be useful in leprosy, and that the fruit is a cure for the disorder which causes the patient to become what is known as a dirt-eater.

"The tree produces a beautiful clear gum, which makes a fine varnish, and is said to possess a special virtue in preserving woods from insects. The sap of the tree, like its congener, *Semecarpus anacardium*, produces an indelible stain on linen. Professor Lindley makes Martius responsible for a statement that the nut has a wonderful effect upon chronic inflammations of the eyes, especially such as are of scrofulous nature, when simply borne or carried by the persons affected. It is also a common belief in Trinidad that a necklace or collar of cashew nuts has a remarkable curative effect upon some of the diseases of the canine race, especially for coughs or distemper."

The wood is very hard and strong. It is much appreciated for making the hubs of carriage wheels, yokes, and other farm utensils. Its principal use in Porto Rico is for charcoal and fuel; specific gravity, 0.488. (Grosourdy, **2**:404.)

Aname.

In the market of Ponce large nut-like seeds said to be derived from a tree were on sale. They are ground up and put into rum for the sake of the rather pleasant pungent flavor, and are also supposed to have medicinal properties.

Anamu. See *Pavonia typhalea.*

In the market of Ponce material with this common name was on sale as a medicine. It is boiled in water and the decoction used for the relief of pain in the stomach.

Ananassa ananas. PINEAPPLE. PIÑA.

The pineapple is the one fruit in the production of which Porto Rico already has a good reputation, one of the largest and best varieties being known as the "Porto Rican." There can be little doubt that natural conditions, entirely favorable to this culture, exist in many parts of the island, but it is not on this account to be inferred that our markets will be flooded at once with cheap fruit from Porto Rico. In order to furnish a regular commercial supply it will first be necessary to bring into existence an organized productive industry. The wild and half-wild pineapples brought in by the rural natives and sold in the town markets would not go far in supplying an export trade, and while many individual high-grade fruits are secured the quality is, of course, extremely uneven and areas of one variety have seldom been planted. An initial difficulty, as in Florida, will probably arise in the scarcity of cuttings of good varieties. In Florida this is by far the largest item of expense in new plantings, even in comparison with the frost sheds which cost between $300 and $500 per acre. But cuttings of good varieties bring from 10 to 20 cents apiece, and although this means between $2,000 and $3,000 per acre for plants, the grower has his returns in disposing of his own suckers at similar prices. Of course it is not to be expected that this rate can be indefinitely maintained. Such prices are possible only while the industry is rapidly expanding, and as soon as the normal demands of the market are once filled there will come an inevitable and probably a very rapid decline in the valuation of cuttings.

Florida pineapple growers have found, however, that the partial shade of the frost sheds exerts a most beneficial influence upon the size and quality of the fruit, and the use of sheds for shade purposes is now being extended far below the frost line. The inference is natural that the production of high-grade fruits in Porto Rico will require the introduction of the Florida methods of culture, especially since the small importations which have already been made from Porto Rico were badly damaged by sun scald.

It is not impossible, however, that situations might be found in Porto Rico where the injury from this cause would be very slight, and there is a further probability that if shade proves to be necessary it can be supplied more cheaply by means of some of the many leguminous shade trees, which will also assist in maintaining the fertility of the land. We did not notice any plantings which seemed to have been made with reference to shade, although it is well known in the Tropics that partial protection from the sun encourages the growth of large pineapple fruits.

Serious competition on the part of Porto Rico with the well-developed pineapple industry of Florida is not to be expected for a series of years, though the very favorable natural conditions render it certain that an increasing quantity of this fruit will be sent to the American market. The Florida supply does not, however, meet the popular demand, even at prices far in advance of the actual cost of raising and marketing the fruit, and at more reasonable rates there is little doubt that the present consumption would be quickly doubled or trebled. There is, accordingly, ample room for the expansion of pineapple growing as an agricultural industry both in Florida and in Porto Rico.

Local conditions and varieties.—The pineapple season at Ponce is from April to July, after which time none are obtainable. Small-sized fruits of fine flavor and texture are preferred, and command a higher price than the large ones for which the island is particularly noted. On the north side of the island pineapples are said to be obtainable from April to September. Those at higher altitudes ripen first, while lower down the crop is not ready for market until July, though the fruits are of better quality.

Sandy and gravelly loams are the preferable soils for fruit production in Porto Rico, although the plants apparently thrive in all situations. Limestone soils not subject to too great drought are also desirable. To facilitate clean culture the plants are set 3 feet (90 centimeters) apart in rows 5 feet (150 centimeters) apart. The same piece of ground remains productive from four to eight years, dependent upon soil and culture. For shipment the fruits are cut before the commencement of the ripening process, and it is desirable to make a clean cut and leave an inch (25 millimeters) or more of the stem to avoid decay and prevent drying out. With proper packing and ventilation pineapples will not suffer at all from the brief sea voyage, and the shipping rates will probably be as low as or lower than from Florida. The transportation difficulties arising on shore will not, however, be so easy of adjustment in the near future, except in the immediate vicinity of the ports, and will undoubtedly retard the development of the pineapple business.

The custom so prevalent in Porto Rico of placing the sliced fruit in salt water before eating is evidently very old, as Acosta says of the inhabitants of the West Indies, "They eat it being cut in morsels and steeped a while in water and salt."

There is also a belief, more or less widespread, in Porto Rico that pineapples and coffee should not be partaken of at the same meal.

An insect enemy.—On both sides of the island young pineapples were found to be infested by a mealy-bug, which is said to prevent normal growth and finally to rot the fruit. The same insects are also to be found in great numbers on the Bromelia "piñuelas," or wild pines, a related plant found everywhere in Porto Rico. To be rid of the mealy-bugs it may be found necessary to destroy all the Bromelias in the neighborhood of pineapple farms. It is not likely that the ants would carry the mealy-bugs any great distance, though a separation of several rods would probably be required. An experiment with kerosene emulsion for driving away the insects which had already settled was reported as quite successful.

Andira inermis. CABBAGE TREE. MOCA.

A leguminous tree called "cabbage tree" or "cabbage bark tree" in Jamaica on account of its disagreeable odor. It is generally distributed in Porto Rico, and is sometimes used for coffee shade, but is considered inferior to the two species of Inga on account of its slow growth. The bark, in the form of a powder or a decoction, is said in Jamaica to have value as a cathartic and vermifuge, but large doses are dangerous, causing vomiting, delirium, and even death. The wood is said to be hard and durable, having a specific gravity of 0.88, and is susceptible of a high polish. The pods are fleshy, about the size of a horse chestnut, and contain but a single seed. The floors of the caves of Aguas Buenas, Porto Rico, are in places covered with the seeds of this species, which are carried in by bats for the sake of the inclosing pulp. These seeds germinate in the caves, sending up slender white sprouts 2 or 3 feet (60 to 90 centimeters) high.

Grosourdy (**2**: 395) reports *A. racemosa* in Porto Rico with the same common name. As subsequent writers report only one species, the determination is probably in error. He says of the wood: "It is rather hard, and its color varies greatly, specimens varying from yellow to reddish flesh-color, brown, or black having been seen. For this reason two varieties are called 'moca colorada' and 'moca amarilla.' Both are, however, produced in the same tree. The wood is also variously marked and sometimes produces a very pleasing effect. Specific gravity, 0.748. It is used to considerable advantage in making the hubs of wheels. Made into boards it is suitable for flooring and all sorts of carpenter work. It was formerly used in Brazil in the construction of boats. In Porto Rico its most common use is for the framework of country houses. It is imported into Europe and used to make canes and umbrella and parasol handles, and for turned parts of cabinet work."

Anemia.

In the woods through which the road winds to the west of the Guajataca River, near Quebradillas, we found *Anemia adiantifolia* and the little species usually called *A. aurita*. In the latter the fertile frond is fertile throughout, and it should be associated with Coptophyllum, although that genus was established by Gardner with the obviously mistaken idea that in the typical Aneimia two fertile fronds are united with a sterile, a theory of fasciation violently improbable on morphological grounds. All the requirements of the phenomena are much better met by observing the simple fact that in Aneimia proper only the lowest pair of pinnules is fertile, while in *Coptophyllum auritum* and its congeners we have the ordinary case of completely dimorphic fronds. That the fertile frond of Aneimia should have the fibro-vascular system modified in accordance with the requirements of its double function may be viewed as an adaptation and is not necessarily an anomaly.

Angela. See *Moringa moringa.*

Angelica tree. See *Sciadophyllum brownei.*

Angelón. See *Angelonia angustifolia.*

Angelonia angustifolia. ANGELÓN.

Family Scrophulariaceae; an annual herb, cultivated in gardens as an ornamental. The same may be said of *A. salicarifolia.* (Stahl, **6**: 234, 235.)

Anguria plumieriana. ALGODONCILLO.

Family Cucurbitaceae; a pubescent vine, rare on the north side of the island and confined to mountainous districts made inaccessible by rain during the winter season, the time of flowering. (Stahl, **4**: 176.)

Aniba bracteata.

Family Lauraceae; has oblong leaves 12 to 18 inches (30 to 45 centimeters) long; known from Yabucoa. (Sintenis.)

Añil. See *Indigofera anil.*

This is the Spanish for indigo and is applied also to other indigo yielding species.

Añil cenizo. See *Cracca cinerea.*

Añil falso. See *Cracca aniloides.*

Añil racimillo. See *Cracca leptostachya* and *C. purpurea.*

Anistus arborescens. See *Acnistus arborescens.*

Anoda hastata. VIOLETA.

Family Malvaceae; an annual herb native in Porto Rico, but also introduced from the continent. (Stahl, **2**: 59.)

Anón. See *Anona squamosa* and *A. dolabripetala.*

Anona dolabripetala. ANÓN.

Reported from Porto Rico by Bello, but not known to Stahl, who seems to consider it somewhat doubtful. Bello's locality was Furnias, according to Stahl, but this is not so stated in Bello's paper. This species is also given as a synonym of *Rollinia longifolia.*

Anona montana. GUANÁBANO CIMARRON.

An indigenous shrub or tree of mountain districts; not common. The wood is fibrous and of poor quality. The fruit is globose with soft spines from the middle of round or polygonal areas. It is not edible. (Stahl, **2**: 24.)

Anona muricata. SOURSOP. GUANÁBANO.

Family Anonaceae; a small tree. The fruit called the "soursop" is well known throughout the tropics. It has a rough green skin, inclosing a soft and juicy white pulp of an agreeable, slightly acid flavor, in which are embedded the large brown seeds. In the mature condition the weight may reach 2 pounds or more.

Grosourdy (**2**: 387) says there are several varieties. The wood which is not used is soft and light-colored, and breaks with a horizontal fracture. Specific gravity, 0.397.

An infusion of the leaves is said to be a remedy for dysentery.

Anona palustris. ALLIGATOR APPLE. CAYUR.

An indigenous shrub of 2 to 5 meters, affecting swampy localities. According to Dr. Stahl this species has astringent properties. The fruit is not edible. Bello calls this "corazon cimarron" as well as "cayurz." (Stahl, **2**: 25.)

A small tree 24 to 30 feet (8 to 10 meters) high, the trunk reaching 10 or 12 inches (25 to 30 centimeters) in diameter. The wood is very light and soft, fibrous in texture, gray or light brown somewhat tinged with green, lustrous and sometimes somewhat marbled, but with long exposure to the air it turns a dirty white. Specific gravity of the roots, 0.175. Used in the country for rafts. The wood from roots that have grown in bogs is extremely soft and porous, and is used in Cuba to sharpen razors.

Called also "guanábano cimarron" and "corcho." (Grosourdy, **2**: 364.)

Anona reticulata. BULLOCK'S HEART. CORAZON. CUSTARD APPLE.

A wild tree not very abundant, 25 to 30 feet (8 to 10 meters) high, rather dense. The trunk is ordinarily straight, and 10 to 14 inches (25 to 35 centimeters) in diameter. Furnishes a light wood, rather soft, but resistant. Fibrous in texture, moderately close-grained. The wood is handsome in appearance but is not used. (Grosourdy, **2**: 377.) These dimensions are certainly much larger than any seen in the island.

The fruit is of a more regular oval shape than that of the soursop, and the skin is much more nearly smooth, being marked merely with small slightly raised areas. The flesh is yellow, and is generally considered inferior to that of the soursop.

Anona squamosa. Sweetsop. Anón. Cherimolia.

A low tree or shrub widely cultivated throughout the tropics, though not considered the equal of the soursop. According to Bello, the name "chirimoya" is applied to this species in the western part of the island. (Stahl, **2:** 26.)

Anthacanthus spinosus. Espinosa.

Family Acanthaceae; a shrub growing in thickets on the north coast, near Cangrejos, and also known from Humacao. (Stahl, **6:** 246.)

Antherylium rhorii. Rosa de cienega.

Family Lythraceae; a much branched tree, 3 meters high, found on the south coast; also reported from the island of St. Thomas. (Stahl, **4:** 123.)

Anthurium acaule. Plate XVII.

Family Araceae; a herbaceous plant of no economic value sent in by all collectors.

Antigonon leptopus. Plate XVIII.

An ornamental climbing vine belonging to the family Polygonaceae. The clusters of showy pink flowers sometimes cover large areas and suggest the appearance of Bougainvillea, for which Antigonon is probably often mistaken. The beautiful pink color of the latter is, however, very different and much more beautiful than the rather unpleasantly conspicuous purplish tint of Bougainvillea. Antigonon is probably also superior as a rapid grower and a more effective climber. The flower clusters also serve as tendrils and shorten themselves or "take in the slack" by bending at the joints in a zigzag form. The specimen photographed was taken at Coamo Springs, but the plant was seen at numerous places and has been collected by Sintenis at Fajardo. It is supposed to be a native of western Mexico.

In Cuba the species is called "coralillo" or "coralillo rosado," but no common name has been recorded from Porto Rico. Another Mexican species, *A. cinerascens* is reported as introduced into St. Thomas.

Antirrhoea.

A genus of rubiaceous shrubs. Several species have been collected by Sintenis in different parts of Porto Rico.

Antirrhoea acutata.

From Guanica. A tree 5 to 8 meters in height from the southwestern part of the island; Ponce, Guanica, Cabo Rojo. (Urban, Symb. **1:** 439.)

Antirrhoea coriacea. Quina.

Also called "boje." A rubiaceous tree attaining 20 meters in height; known in the vicinity of Utuado and from several other localities. It has been placed by Stahl and other writers under Stenostomum, Exostemma, and other genera. (Urban, Symb. **1:** 436.)

Antirrhoea lucida. Palo llorón.

Family Rubiaceae; a shrub of 3 meters; locality not known. (Stahl, **5:** 59) as *Stenostomum lucidum.*

Antirrhoea obtusifolia. Tortuguillo.

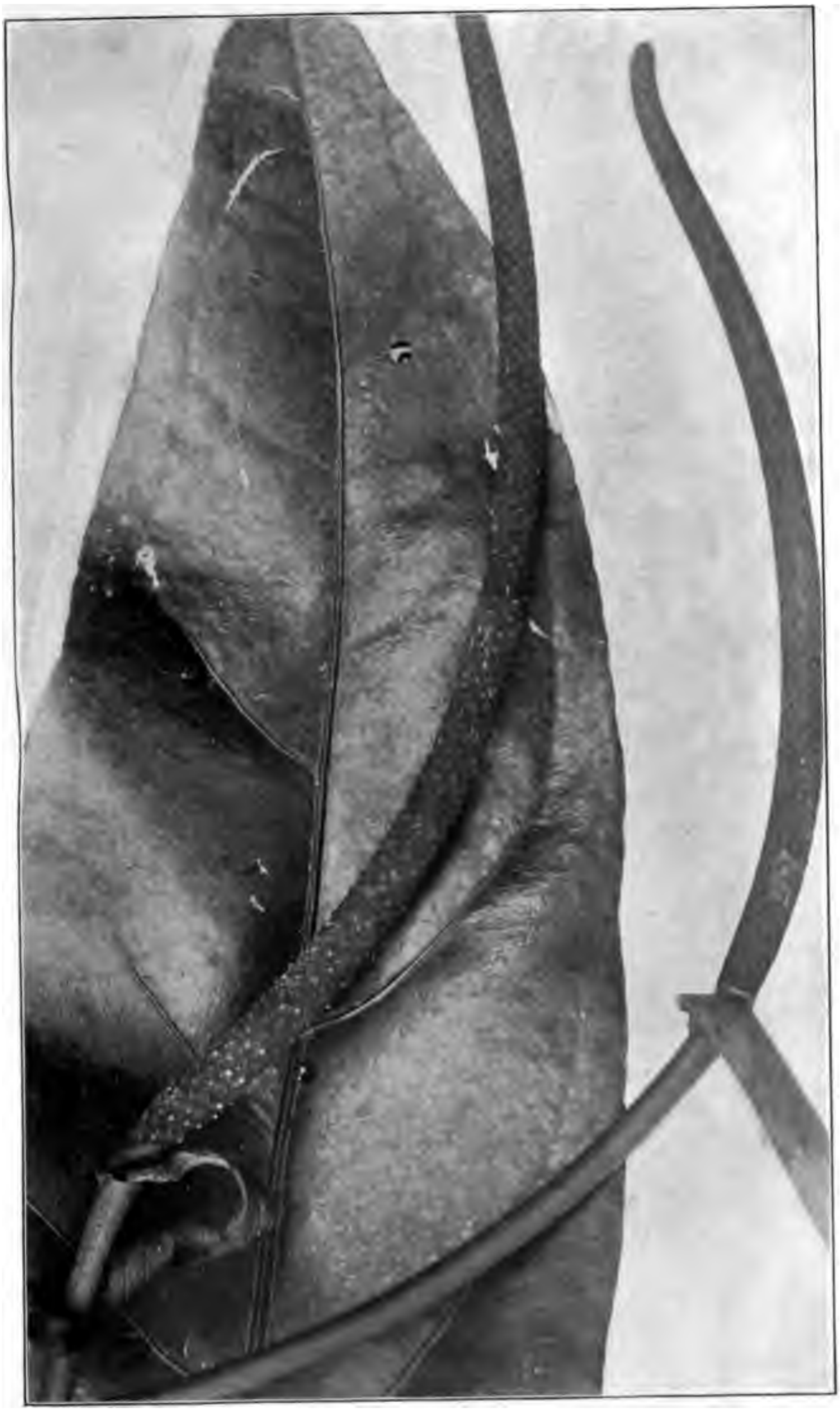
A rubiaceous tree 8 to 15 meters in height, recently described as a new species from the mountains of Luquillo and Yabucoa. (Urban, Symb. **1:** 435.)

Antirrhoea resinosa. Aquilon.

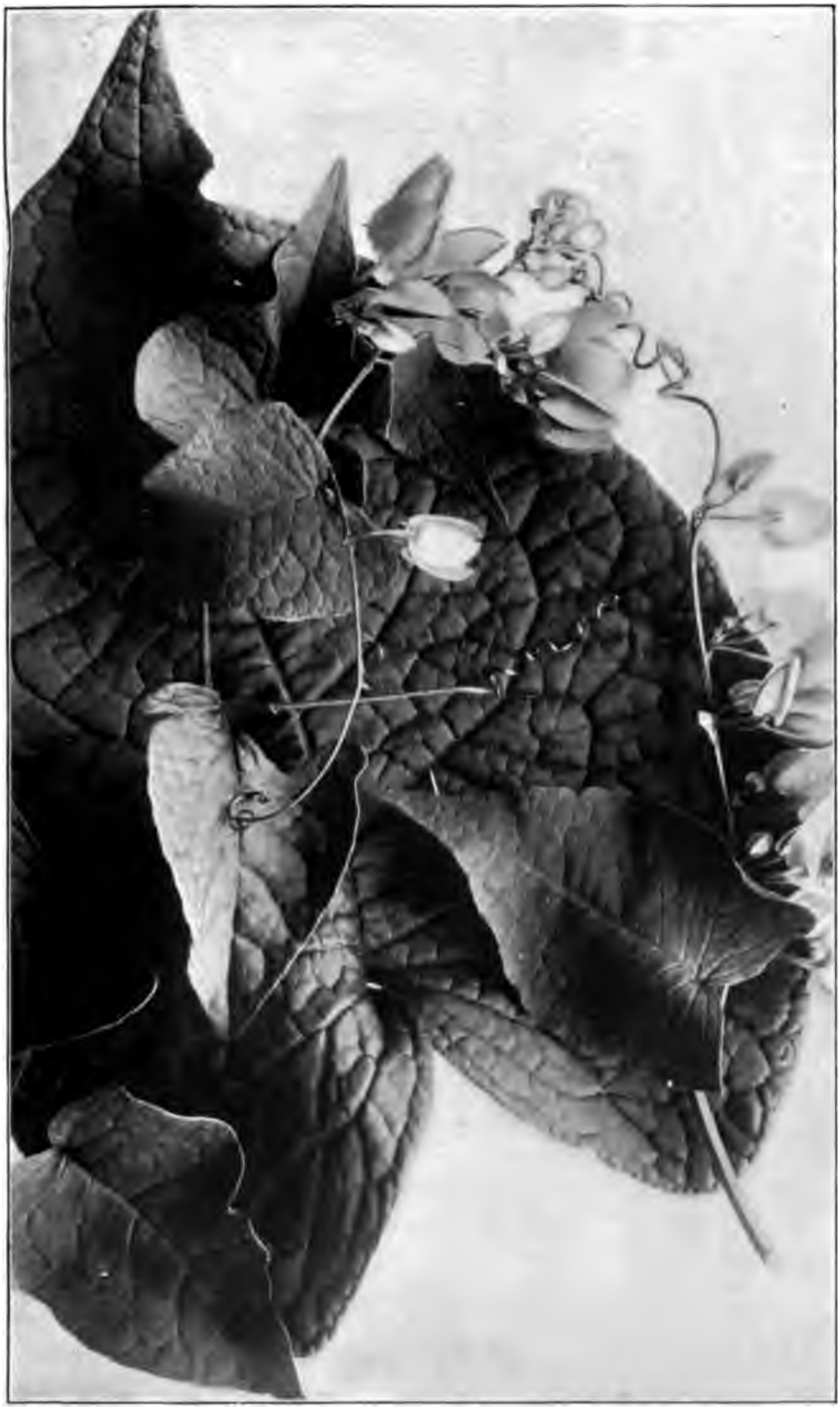
A tree 10 meters high; the branches covered with a sticky powder. Found in mountain districts; wood employed in building. (Stahl, **5:** 58, as *Stenostomum resinosum.*)

Antirrhoea sintenisii.

Another new species from the vicinity of Manati. (Urban, Symb. **1:** 438.)



ANTHURIUM ACAULE.



ANTIGONON LEPTOPUS. COAMO SPRINGS.

Aquilon. See *Laugeria resinosa.*

According to Captain Hansard the specific gravity of wood of "aquilon" is 0.88.

Arachis hypogea. PEANUT. MANÍ.

Porto Rican peanuts are of very small size, and not many are grown. They are hawked upon the streets by boys, much as with us.

Aralia arborea. See *Gilibertia arborea.*

Araucaria excelsa. NORFOLK ISLAND PINE.

This beautiful coniferous tree is a conspicuous object in gardens and parks in the Canary Islands, but is either very scarce or entirely absent in Porto Rico. That it would flourish if introduced is indicated by the fact that it has been found to succeed well in Trinidad.

Árbol de la cera. See *Sapium sebiferum.*

Árbol del pan. See *Artocarpus communis.*

Árbol del sebo. See *Sapium sebiferum.*

Ardisia.[a]

A large genus of shrubs, or small trees, of the family Myrsinaceae. Many of them are fine ornamentals, and a considerable number of species appear in horticultural trade. Several of the Porto Rican species are little known, as yet, and should be canvassed with reference to their desirability for introduction for the above purposes.

Ardisia coriacea. MAMEYUELO.

A tree 3 to 4 meters high found in the mountains and in waste places. Also reported from Panama and the island of St. Thomas. (Stahl, **6**: 38.)

Ardisia crenulata. See *Parathesis crenulata.*

Ardisia glauciflora. MAMEYUELO.

A tree of 5 to 8 meters, with leaves 8 or 9 inches (20 to 23 centimeters) long, leathery and finely veined. Like *A. sintenisii* and *A. yunquensis* (shrubs of 3 to 4 meters) known only from the Luquillo Mountains. (Urban, Symb. **1**: 382.)

Ardisia guadalupensis.

Collected by Sintenis about Coamo and near Rincon.

Ardisia pendula. JACANILLO.

A tree of 5 to 10 meters from the vicinity of Cayey (Aibonito, Lares, and Manati).

Ardisia purpurascens.

Native names: "Quebra hacha," "mameyulo," and "hacanilla." A shrub, or small tree, 10 meters or less in height. A variety *corymbifera* is known from Utuado and Yabucoa; a variety *genuina* from Barranquitas.

Ardisia sintenisii.

Known only from the Sierra de Luquillo.

Ardosna jardin. See *Alternanthera repens.*

Areca catechu. BETEL PALM.

Family Arecaceae: in the western end of the island the betel palm of the Malay region has been sparingly introduced. A few were seen in gardens about Mayaguez and others in and near San Sebastian. So far as we were able to learn, the people do not know the name or nature of this introduced species, which is apparently planted only as an ornament or a curiosity. The form is not unpleasing, but the extremely deep, somber green of the foliage seems almost unnatural and imparts a suggestion of artificiality.

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[a] The generic name Ardisia (Swartz, 1788) is antedated by Icacorea Aubl. (1775), but as few of the species have been transferred to this genus, they are here retained under their commonly accepted designations.

Arenga saccharifera. GOMATU.

An East India palm cultivated in Jamaica, but not known to have been introduced into Porto Rico. Called "cabo negro" in the Philippines.

Argemone mexicana. CARDOSANTO.

Family Papaveraceae; an herb, native of Mexico. The seeds possess acrid, narcotic, and purgative properties, and are employed as a substitute for ipecacuanha. The yellow juice of the plant is said to be used in ophthalmia. (Stahl. 2: 33.)

Argithamnia candicans.

Family Euphorbiaceae; from Guanica.

Argithamnia fasciculata.

From Guanica (Sintenis).

Aristolochia oblongata.

Family Aristolochiaceae; this and other species of Aristolochia are twining vines, with very peculiar pipe-shaped flowers. There are numerous species in the West Indies and probably several will be found in Porto Rico. "Contrayerva" is given as local name for this genus by Grisebach.

Arnotta. See *Bixa orellana.*

A name used in some of the British Islands. Anatto is the preferable form.

Aroma. See *Lasianthus lanceolatus.*

Aromo. See *Acacia farnesiana.*

At Coamo Springs this name was used for *Cleome spinosa*, but near Ponce the more correct application was made.

Arrabidaea chica.

A bignoniaceous shrub, with large, flat, leathery pods; the variety *thyrsoidea* has been collected on calcareous mountains near Bayamon.

Arracacha. See *Arracacia esculenta.*

Arracacia esculenta. ARRACACHA.

An umbelliferous garden vegetable presumably introduced from Venezuela by the Spanish refugees, who also brought the culture of cacao. The "arracacha" seems to be grown somewhat extensively in the mountains behind Ponce, where large quantities appeared in the market. It requires a very equable climate, and will not endure extremes either of heat or cold. As its botanical affinity might indicate, the flavor suggests that of the carrot or parsnip, but it is said to be superior to either, and some Europeans become very fond of it.

In Venezuela and Colombia the culture of "arracacha" has been long an industry of considerable importance, and attempts have been made to introduce it into Europe, but without success. The following account of the Venezuelan culture is by Mr. David G. Fairchild, agricultural explorer of this Department, who visited Venezuela in 1898.

"The culture of the native 'apio' in Venezuela is an extensive one. There is no question that it competes with the potato for a place as the most important food plant among the peones of the interior elevated regions. It is also highly esteemed by the Europeans living in Venezuela, and is met with on the hotel tables as a constituent of certain vegetable soups, resembling somewhat carrots and passing as such among the less observant. I consider it very much superior to carrots. In general it is served boiled, precisely as parsnips are treated. So-called *buñuelos* or fritters are prepared from the grated roots by frying them in lard. Cut in thin slices and fried it is delicious, and as a souffle it is said to be unexcelled.

"The culture of this vegetable is confined to the higher altitudes, where the mean annual temperature is 58 to 60 degrees F., the 'tierra fria' of the Venezuelans, and carried on on a small scale by the peones, small cultivators and

Italians, which latter, by the way gave the name 'apio' (celery) to the plant because of its superficial resemblance to the Italian apio.

"The plant thrives best in good rich soil, though growing successfully in barren sandy soil. It resembles superficially celery. The plant is propagated from root cuttings almost exclusively, the enlarged leaf bases forming small 'heads,' which are cut from the edible roots and planted, one in each hill, just as onions are planted. In the course of eleven months a mass of edible roots the size of a man's head has been formed, and a dozen or more of the 'heads,' which can be used for planting the following season, after being removed from the roots and allowed partially to dry. How long these heads can be kept alive without planting is a question I have not been able to answer. According to Jose A. Diaz, El Agricultor. Venezolano o' Lecciones de Agricultura Practica Nacionae, J. I. Caracas, 1877, pages 67–71, Señor Várgas has published[a] an article on the culture of arracacha. In this article, which is quoted at length by Diaz, the statement is made that the plant originated in the provinces of Santa Fe and Caracas; and that now its culture in Colombia is as common as that of the potato in England. It matures in three or four months sufficiently to be of value in the kitchen, although a longer period allows much larger roots to develop. The best variety comes from Lipacon, near Norte de Santa Fe de Bogota, in Colombia. Specimens of the plant were imported into Europe in 1824, and in Liverpool a specimen flowered. These plants were, however, imported from Trinidad, and not from Venezuela. It is probable that those from the high regions of Colombia and Venezuela will succeed better than those from the warm regions of Trinidad. Humboldt and Bonpland mentioned having found in New Granada, near Teindala, province of Pasto, at 700 meters, a wild plant called 'sacharacacha' (a name similar to aracacha). This is possibly a variety of the Venezuelan plant. For trial in America the sprouts should be planted as soon as possible in the spring and given a long season to develop in. They should be tested in all the southern experiment stations, and may be even worthy of trial in the northern ones. The question of keeping the sprouts over winter may be a difficult one to answer, as the plant rarely sets seed."

Arrayan. See *Myrica cerifera*, also *Myrsine coriacea* and *M. floribunda*.

In the market of Ponce leaves of "arrayan" were on sale as a remedy for rheumatism. The application is made in the form of a tincture with rum.

Arrowhead. See *Sagittaria acutifolia*.

Arrowroot. See *Maranta arundinacea*.

Artemisa. See *Ambrosia*.

Artocarpus communis. BREADFRUIT. ARBOL DE PAN.

Family Moraceae; in Porto Rico the breadfruit is commonly called "castaña," the Spanish name for the chestnut. This doubtless results from the fact that the seeds are the part generally used, and these bear considerable resemblance to large Spanish chestnuts. They are frequently sold in the market in a germinating condition (see photograph) and are boiled for a few moments before eating. Seedless varieties of the breadfruit also exist, but it was not ascertained that such have been introduced into Porto Rico. In some regions the name breadfruit is restricted to the large seedless form, while those which produce seed are called "bread nut." This name is also applied to other species of Artocarpus. One of these is the "jack fruit," which has been introduced from the East Indies into Jamaica. It bears an oval fruit, 18 inches (45 centimeters) or more long, weighing 30 or 40 pounds (13 to 18 kilograms). If this is not already known in Porto Rico steps should be taken to secure it.

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[a] Annals of Botany (Sims & König), Vol. I, p. 400.

Furnishes a wood yellowish gray in color; rather light and soft, but strong, resistant, and elastic. It is highly appreciated for furniture and for building houses. Specific gravity, 0.495. Also called "palo de pan." (Grosourdy, 2: 406.)

The breadfruit grows about Ponce only in valleys and moist places, and is far less common than on the north side of the island. Along the Rio Portugas, near the baths of Quinitana, several trees were noticed which had had their trunks and larger branches for 20 feet (6 meters) up and more severely hacked, doubtless to induce fertility.

A substance somewhat resembling rubber may be made by boiling the milky mucilaginous juice of the breadfruit tree with cocoanut oil. The resulting material is said to be tough, durable, and waterproof, and is called "canoe gum," because used to close the seams of canoes and wooden utensils. Before hardening, it also serves as birdlime.

Artocarpus integrifolia. JACK FRUIT.

"I am strongly in favor of the jack as the tree best suited for providing shade for fields of coffee. In the first place, its presence, so far from being prejudicial, seems to be actually beneficial to the coffee plant; next, it is a subsoil feeder; then it produces a fruit much valued by the natives; its timber is also valuable, whether for cabinetmaking or building purposes; and, finally, it flourishes best precisely in those conditions where its shade is most required. Known to botanists as the *Artocarpus integrifolia*, the Jack grows to a large size; it resembles and belongs to the same family as the bread fruit tree. The timber, when newly cut, is of a light yellow color, possesses a beautiful grain, and is capable of a high polish, not greatly inferior to that of the mahogany or satinwood, both of which it resembles to a certain extent in grain and color after having been polished. The fruit is as large as a pumpkin and weighs from 20 to 30 pounds (9 to 13 kilograms), containing from 200 to 300 seeds, which, though somewhat unpleasant in smell when raw, are converted by being roasted or boiled into a wholesome farinaceous food, always much appreciated by the coolies.

"The jack is said to bear transplanting badly, and it will therefore be necessary to deposit two or three of the seeds a couple of inches below the surface wherever a tree is desired to grow. The most healthy of the plants can afterwards be selected."—Hull.

Asclepias curassavica. ALGODONCILLO. BLOODFLOWER.

Also called "platanillo." An indigenous milkweed appearing in Urban's Symbolae as a variety of *A. nivea*. In some of the West Indies it is used as an emetic in substitution for the true ipecac, which is derived from a South American plant of the family Rubiaceae. A new variety (*concolor*) has recently been described by Krug and Urban, distinguished by having the corolla yellow. (Urban, Symb. 1: 389.)

Asclepias nivea. PLATANILLO BLANCO.

An indigenous milkweed 1½ to 3 feet (0.5 to 1 meter) in height.

Asimina blainii.

An anonaceous shrub or tree from Utuado.

Assaoa fascicularis. See *Henriettella fascicularis*.

Astromeda. See *Lagerstroemia indica*.

Atelandra. See *Meliosma*.

An indigenous genus of two species doubtfully referred by its author, Bello, to the Myrsinaceae. The name is preoccupied in the Labiatae and would need to be changed. Urban refers the species to Meliosma.

Atelandra laurina. See *Meliosma herbertii*.

Atelandra obtusifolia. See *Meliosma obtusifolia*.

Atriplex cristata.

Family Chenopodiaceae; a native saltbush; known from the vicinity of Guanica.

Attalea.

Sintenis collected about houses near Victoria, Aguadilla, leaves and young fruit of a palm determined by Drude as belonging to the subtribe Attaleeae. *Attalea cohune*, native in Honduras, is cultivated in Jamaica. The seeds are said to be extremely hard and are turned into buttons and other small articles like those of the African wine palm Raphia.

Ausu. See *Amomis caryophyllata.*

The name is also applied to *Myrcia pagani* and probably to other Myrtaceae.

A tree from the northeast part of the island; height, 100 to 110 feet; diameter, 10 to 12 inches. Wood purplish, very hard; specific gravity 1.203; used in cabinet-making. (Exp. 1857.)

Grosourdy (**2**: 363) describes this as 35 to 40 feet (11 to 13 meters) high with a trunk 10 to 12 inches in diameter. The wood is very strong, the heart pale, the exterior portions white. Breaks with a vertical fracture, and is used for shelving.

Ausubo.

Stahl gives this name for *Bumelia nigra*, which in the Index Kewensis stands as a synonym of *Dipholis salicifolia.* According to Hill and others it is used for *Sideroxylon mastichodendron*, while Bello says *Sapota sideroxylon*, a synonym of *Achras sapota.*

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 50 to 55 inches (1.2 to 1.3 meters). Wood red, very hard; specific gravity, 1.158; used in housebuilding. (Exp. 1857.)

The tree known to Captain Hansard as "ausubo" has leaves not unlike those of *Ficus elastica*, but somewhat smaller and thinner; when mature they turn red. The fruit somewhat resembles the sapodilla.

"The wood is clear, dull reddish-brown; moderately conspicuous ducts, in short, detached, long and short chains (single line of cells) evenly diffused; chains usually between two medullary rays; medullary rays very numerous, minute, indistinct; wood fibers slightly interlaced and appearing straight-grained; resembles somewhat a fine-grained teak. It is the chief and the most used timber on the island, being noted for its great durability. It is used in the making of wagon wheels, which are turned out by machinery in Ponce, and small stocks of it were noticed in several towns. It is close-grained and beautiful in color, and should be utilized for veneering. It would make most excellent furniture." (Hill and Sudworth.)

Under this name Grosourdy (**2** : 363) refers to Acana and adds that the military authorities of San Juan use this wood for the spokes of wheels, axles of carriages, etc. Some of its particular uses are for beams in houses, windows, doors, etc.

Auzu. See *Amomis caryophyllata.*

Averrhoa bilimbi. BIMBLING. BILIMBI.

Avicennia nitida. MANGLE BLANCO. BLACK MANGROVE.

Family Verbenaceae; a shrub or tree growing in tidal swamps: the wood is considered valuable for its peculiar durability in damp situations, and is accordingly used for foundations and drains; under ordinary circumstances it decays quickly; the bark is used for tanning. Bello calls this "mangle bobo." (Stahl, **6** : 220.)

This is called both "black" and "white" mangrove. The former perhaps because of the dark-colored bark, the latter because of the tomentose leaves. Also called "olive mangrove."

Avicennia officinalis.

Reported by Grosourdy under the name "mangle blanco."

Avipillo. See *Mayepea caribaea.*

Avispillo. See *Turpinia paniculata.*

Avocado pear. See *Persea gratissima.*

Avocate. See *Persea gratissima.*

Azafran.

A tree from all parts of the island; height, 45 to 50 feet (14 to 15 meters); diameter, 20 to 25 inches (50 to 63 centimeters); wood, yellowish, hard; specific gravity, 0.628; used in building houses. Also called "laurel puero." (Exp. 1857.)

Azota-caballo. See *Malpighia coccigera* and *Duranta plumieri.*

Azufaifo. See *Zizyphus reticulata.*

Babeiro. See *Echites circinalis* and *E. umbellata.*

Babeiro amarillo. See *Echites andrewsii.*

Bacopa chamaedryoides. Yerba de culebra amarilla.

Family Scrophulariaceae; a decumbent annual, found in ditches and moist places. (Stahl, **6** : 231, as *Herpestis chamaedryoides.*)

Bacopa monniera. Yerba de culebra.

Herb found in the same kind of places as the last. *B. repens* and one other species receive the same common name.

Bactris pavoniana.

A small palm reported from Porto Rico by Grisebach, but with no more definite locality. The pinnae are narrow and grass-like a quarter or half an inch apart, and there are more than 30 pairs, 12 to 18 inches (30 to 45 centimeters) long, from 2 to 4 lines (4 to 8 millimeters) broad, but remaining united toward the end of the leaf, and here 6 to 8 lines (12 to 16 millimeters) broad; prickles scattered, the longest 2 inches (5 centimeters).

Baculo. See *Agati grandiflora.*

Badiera de Santo Domingo. See *Badiera domingensis.*

Badiera domingensis. Badiera de Santo Domingo.

Family Polygalaceae. Bello reports this from Guanajibo: not found by Stahl. (Stahl, **2** : 54.)

Badinjan. See *Solanum melongena.*

Bahama grass. See *Capriola dactylon.*

Ballata tree. See *Mimusops.*

In Dominica this name is said to be applied to *Bumelia retusa.*

Balsam apple. See *Momordica charantia* and *M. zeylanica.*

Balsam fig, Balsam tree. See *Clusia rosea.*

Balsamillo. See *Coccocypselum repens.*

Bálsamo. See *Psychotria undata.*

Bálsamo amarillo. See *Hamelia lutea* and *H. patens.*

Bálsamo colorado. See *Hamelia patens.*

Bamboo.

In Porto Rico the bamboo is apparently of rather recent introduction, and is neither so common nor so widely distributed as might be expected. A single species is growing at numerous points along the military road, but was nowhere seen in large quantities, and seems not to be known about Guayama. Neither is the bamboo much in use for domestic purposes, although the moist climate is very suitable for growing it and the difficulty of securing wood in some localities should make its value very considerable for miscellaneous farm purposes. It seems most desirable that a selection of the larger and more useful species be introduced from Japan, China, and the East Indies.

An important use of this plant from the agricultural standpoint is in making pots for seedlings. These will last for a year or two, and greatly decrease the trouble and expense of raising and transplanting seedlings of all kinds. The pots are made by simply sawing off the ripe stems an inch (25 millimeters) below the joint and 6 inches (15 centimeters) or more above it. On transplanting, the pot can be split down the side without injury to the roots of the young plant or simply buried in the ground, where it will soon decompose.

In using bamboo for fences in the Trinidad gardens, Superintendent Hart states that it has been found desirable to soak the split stems in water for ten or twelve days in order to dissolve out the sugar and gummy matters which otherwise cause them to ferment and invite the attacks of insects. After removal from the water the stems are to be dried as soon as possible, and will then be as durable as other kinds of wood.

Several species of the genus Bambusa and allied woody grasses have been introduced into the West Indies and have escaped from cultivation. The name bamboo is also applied in the British Islands to some of the large native grasses, such as Arthrostylidium and Chusquea.

Banana. See *Musa.*

Banara portoricensis. PALO DE RAMON.

A shrub or small tree of 3 to 8 meters; family Flacourtiaceae; an indigenous and peculiar recently described species from the vicinity of Adjuntas. (Urban, Symb. **1** : 370.)

Baobab. See *Adansonia digitata.*

Barbasco. See *Jacquinia armillaris*, *J. aristata*, and *Canella alba.*

Barbieria polyphylla. ENREDADERA.

Family Viciaceae. A handsome shrub with long, red flowers. (Stahl, **3** : 86, 160.)

Bardana mayor. See *Xanthium macrocarpum* and *X. canadense.*

Bariaco.

A wild tree reaching a height of 30 feet (9 meters), with a trunk diameter of 18 inches (45 centimeters). It furnishes a wood much appreciated in the country for carpenter work, used especially in house building; also for furniture and certain musical instruments. It is strong and very resistant, fibrous in texture, with a close, fine grain, reddish gray in color, variously marked and marbled. (Grosourdy, **2** : 364.) This author refers this to *Trichilia moschoxylum.* A species that does not appear in Index Kewensis; perhaps it should be *T. moschata*, a Jamaican species.

Basil. See *Ocimum basilicum.*

Basora prieta. See *Waltheria indica* and *Cordia ulmifolia.*

Basote. See *Chenopodium ambrosioides.*

Bastardia bivalvis. ESCOBA BABOSA.

Family Malvaceae. (Stahl, **2** : 69, as *Sida viscosa.*)

Batata. See *Ipomoea batatas.*

Batata blanca. See *Ipomoea batatas.*

Batatilla blanca. See *Ipomoea pentaphylla* and *I. quinquefolia.*

Batatilla carnosa. See *Ipomoea carnea.*

Batatilla ventruda. See *Ipomoea ventricosa.*

Batatilla de zaeta. See *Ipomoea sericantha.*

Batatillo.

Recorded by Bello for *Ipomoea carnosa.*

Bauhinia amarilla. See *Bauhinia kappleri.*

Bauhinia kappleri. FLAMBOYANT BLANCO. BAUHINIA AMARILLA.

PLATE XIX.

Also called "varital." A curious and beautiful leguminous tree, 10 to 15 meters high, cultivated for ornament and shade, and also becoming wild in open places. Supposed to be native in French Guiana. *Bauhinia krugii* is now considered by Urban to be a synonym of this species. (Urban, Symb. **1**: 315.)

Bauhinia krugii. See *Bauhinia kappleri.*

Bauhinia porrecta.

A leguminous tree about 4 meters high, cultivated for its conspicuous flowers. (Stahl, **3**: 127.)

Bayberry. See *Myrica cerifera.*

Bayberry tree. See *Amomis caryophyllata.*

Bayleaf. See *Amomis caryophyllata.*

Bay rum. See *Amomis caryophyllata.*

Bay rum tree. See *Amomis caryophyllata.*

Bay tree. See *Amomis caryophyllata.*

Bejuco blanco. See *Bignonia aequinoctialis.*

Bejuco colorado. See *Rudolphia volubilis.*

Bejuco de agua. See *Vitis caribaea.*

Bejuco de berac. See *Chiococca racemosa.*

Bejuco de caro. See *Vitis sicyoides.*

Bejuco de clavo. See *Bignonia caryophyllea.*

Bejuco de conchitas. See *Clitoria ternatea.*

Bejuco de corrales. See *Serjania lucida.*

Bejuco de costilla. See *Paullinia pinnata.*

Bejuco de garrote. See *Rourea glabra.*

Bejuco de gloria. See *Ipomoea cathartica.*

Bejuco de miel. See *Salmea eupatoria.*

Bejuco de mato. See *Dioclea reflexa.*

Bejuco de mona. See *Cissampelos pareira* and *C. microcarpa.*

Bejuco de palma. See *Marcgravia rectiflora jacquini* and *M. umbellata* and *M. sintenis.*

Bejuco de paralejo.

A name applied to numerous species of Malpighiaceae, such as *Stigmaphyllon* (synonym *Stigmatophyllon*) *floribundum*, *S. periplocifolium* and *S. puberum;* also *Heteropteris chrysophylla*, as well as Triopteris and Tetrapteris.

Bejuco de paralejo rosado. See *Heteropteris purpurea.*

Bejuco de peo. See *Lasianthus lanceolatus.*

Bejuco de puerco. See *Ipomoea setifera* and *I. fastigiata.*

At Santurce this common name was also applied to *Thunbergia alata.* Bello reports it for *Ipomoea bona-nox.*

Bejuco de puerco blanco. See *Ipomoea ciliolata.*

Bejuco de puerco de costa. See *Ipomoea carnosa.*

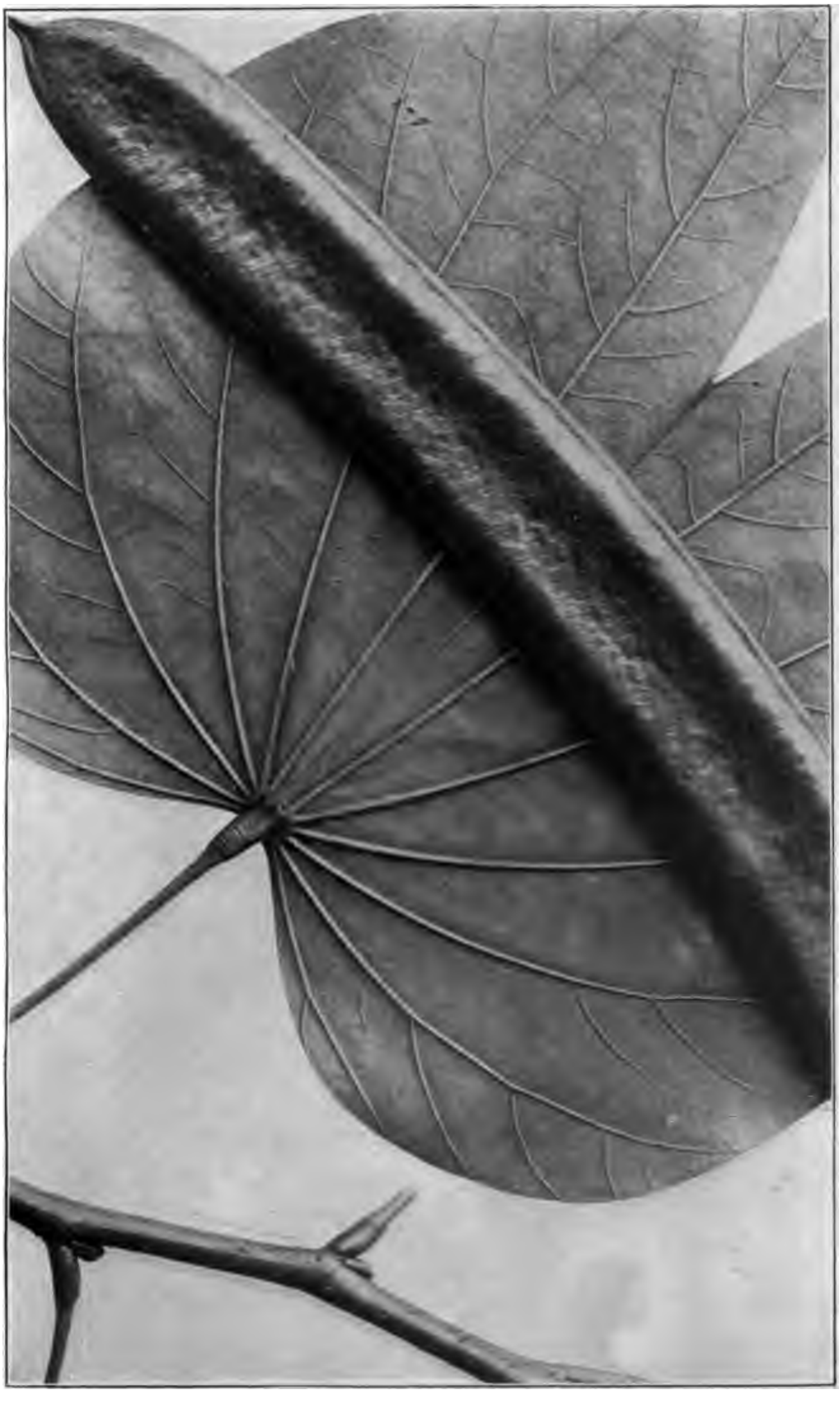
Bejuco de puerco de playa. See *Ipomoea biloba.*

Bejuco de rana. See *Marcgravia rectiflora jacquini.*

Bejuco de San Juan. See *Forsteronia corymbosa.*

Bejuco de sopla. See *Securidaca virgata.*

Bejuco de vaca. See *Ipomoea bona-nox.*



FLAMBOYANT BLANCO (BAUHINIA KAPPLERI). COAMO SPRINGS.

Bejuco inglés. See *Capparis jamaicensis.*

Bejuco prieto. See *Paullinia pinnata*, *Hippocratea ovata*, and *Rudolphia volubilis.*

Bejuquillo de puerco. See *Ipomoea triloba.*

Bellorita. See *Erigeron bellioides.*

Ben. See *Moringa moringa.*

Ben nut. See *Moringa moringa.*

Berengena. See *Solanum melongena.*

Berengena cimarrona. See *Solanum torvum* and *S. inclusum.*

Berengena de marimbo. See *Solanum mammosum.*

Berengena de paloma. See *Solanum virgatum*, *S. callicarpifolium* and *S. lentum.*

Berengena de playa. See *Solanum persicaefolium*

Berengena jamaiquiña. See *Solanum jamaicense.*

Bergamota. See *Citrus medica.*

Berica.

This name is noted as being used near Toa Alta for a shrub said to produce an edible fruit (no. 893) probably a species of Eugenia. At Vega Baja "berica" or "perica cimarron" was a species of Acalypha (no. 1035).

Berros. See *Rorippa officinalis.*

Bertholletia excelsa. BRAZIL NUT.

A large tree belonging to the family Lecythidaceae, and yielding the Brazil or Para nuts of commerce. A tree 100 to 150 feet high, distributed throughout northeastern South America to the Island of Trinidad. It has been cultivated in Jamaica and probably in other islands.

Berugillo.

A wood not much used; specific gravity 0.73; abundant in the hills. (Hansard.)

Betel palm. See *Areca catechu.*

Bichy. See *Cola acuminata.*

Bidens bipinnata. MANZANILLA NEGRA.

An annual composite weed. (Stahl, **5**: 128.)

Bidens coreopsidis. See *Bidens rubifolia.*

Bidens pilosa. MANZANILLA DEL PAIS.

An annual weed; found in all parts of the island. It seems to be more often called "margarita." (Stahl, **5**: 127.)

Bidens rubifolia. MANZANILLA TREPADORA.

Reported as *B. coreopsidis.* (Stahl, **5**: 129.)

Bignonia aequinoctialis. LIANA DE LA SIERRA.

Family Bignoniaceae; a shrubby climber. According to Bello this is called "bejuco blanco." (Stahl, **6**: 177.)

Bignonia caryophyllea. BEJUCO DE CLAVO.

A vine with large aromatic roots which are used to color and impart a pleasant odor to rum. (Stahl, **6**: 180.)

Bignonia odorata. LIANA FRAGRANTE.

A woody climber growing in waste places on the coast. (Stahl, **6**: 178.)

Bignonia unguis. See *Bignonia unguis-cati.*

Bignonia unguis-cati. LIANA UÑADA.

A shrubby climber with sharp claw-like tendrils. Specimens were collected at Guayanillo by Sintenis. Bello calls this "pegapola." (Stahl, **6**: 179.)

Bija. See *Bixa orellana.*
More often called Achiote.

Bilimbi. See *Averrhoa bilimbi.*

Bimbling. See *Averrhoa bilimbi.*

Birch (West Indian). See *Bursera simaruba.*

Biriji. See *Eugenia monticola* and *E. poiretii.*

Bitter wood. See *Picrasma excelsa.*

Bixa orellana. ANATTO. ACHIOTE.

Family Bixaceae. The achiote or anatto is a small tree of handsome appearance, with large, clean, cordate leaves and numerous pink flowers, followed by burlike pods, at first green, but changing to deep red and becoming an inch in diameter. These contain the seeds, the arillus or fleshy covering of which is bright orange in color and constitutes the anatto of commerce. On drying, the arillus becomes dull orange. Quantities of dried seeds are to be found in Porto Rican markets for domestic use in soup and in coloring rice and other dishes yellow. In the English colonies the coloring matter is removed while fresh, and then dried and compacted into cakes, in which form it is exported to the United States for manufacture into butter-color. Supposedly for this purpose 726,269 pounds were imported into the United States in 1899, valued at $34,827 but recent analyses of butter colors show that they consist largely of analine dyes.

The wood is nearly white, porous, light, and very soft, with a specific gravity of 0.399. It has no use whatever. When polished the wood is slightly yellow, or sometimes with a tendency toward red, and very uniform in color, although it retains narrow lines of a slightly darker color, which correspond to the concentric zones to be seen in a cross section. (Grosourdy, **2**: 357.)

Black bead. See *Pithecolobium unguis-cati.*

Black mangrove. See *Avicennia nitida.*

Blechum brownei. YERBA DE PAPAGAYO.

Family Acanthaceae; an indigenous, annual herb, affecting dry situations and flowering continuously. (Stahl, **6**: 244.)

Bleeding heart. See *Colocasia esculenta.*

Bledo blanco. See *Amaranthus paniculatus.*

Blero. See *Mesosphaerum capitatum.*

Blighia sapida. AKEE.

A beautiful tree of the family Sapindaceae, introduced from Africa to the West Indies by the same Captain Bligh who introduced the breadfruit, above which it is said to be valued by the people of Jamaica as a richly flavored and wholesome food. The bright yellow, fleshy arillus is the part eaten. In some islands, however, the akee is avoided as poisonous, though the existence of any deleterious principle has yet to be demonstrated, and it is now suggested by Superintendent Hart, of the Trinidad Gardens, that the cause of injury in the reported cases of poisoning has been the use of decayed fruits, which seems the more probable in view of the recent discovery of the extremely poisonous nature of some of the products of organic decomposition. The following caution should be accordingly heeded by any who may wish to experiment with this fruit:

"It is prepared in Jamaica in many ways, a favorite method being to stew in milk and afterwards to brown in a frying pan with butter. Again it may be boiled or even baked. It is also commonly eaten boiled and mixed with salt fish, onions, and tomatoes as a breakfast dish. Although so commonly used it can not be denied that cases of poisoning have followed the consumption of it as an article of food, but so little cause is there to fear its effects that when in season it is to be found generally on the tables of both rich and poor throughout Jamaica. The cases in which the fruit has produced poisonous effects are generally found to be such as show a careless preparation of the fruit for food. The arillus when in good condition is of a wholesome, nutty flavor, and should be quite firm and not easily broken. If, however, it is kept too long it readily becomes soft and decays, and such decayed parts are doubtless poisonous as any other decayed vegetable or animal matter and quite as likely to cause irritant poisoning. Care should therefore be exercised by the housewife in preparing such a delicacy for table, and if such is taken it may be eaten without the slightest fear, and with the satisfaction of having partaken of one of the finest *bonne bouches* that come to a West Indian table. The writer speaks of it from experience of some twenty years, during which time he has missed no opportunity of securing a share of it when in season."

Blood flower. See *Asclepias curassavica.*

Bocagea laurifolia.

Family Anonaceae: from Guajataca and Sierra de Lares.

Bocconia frutescens. PALO DE PAN CIMARRON.

Family Papaveraceae; an herb with a disagreeable odor. (Stahl, 2: 34.)

Boehmeria cylindrica.

An urticaceous plant of interest chiefly because related to the next species; known from Aybonito.

Boehmeria nivea. RAMIE.

Family Urticaceae; the now celebrated ramie plant or Chinese hemp, the cultivation of which has been so widely advocated. Notwithstanding the numerous attempts at commercial utilization of the fine fiber produced by this species, practical success has not yet been attained, the satisfactory processes and machinery for degumming the fiber being too complicated and expensive to permit ramie to compete in the manufacture of cheap fabrics. The Porto Rican specimens were found by Sintenis in cultivation, near Cabo Rojo. It is not known whether any local use has been made of the fiber.

Boerhavia paniculata. TOSTON.

Family Nyctaginaceae; this species and *B. hirsuta* are common tropical weeds known from Porto Rico, but without recorded local names, "toston" being given as Cuban only. (Urban, 3: 307, 308.)

Boerhavia scandens. PEGA POLLO.

A shrubby herb of about 4 feet (1.2 meters), widely distributed throughout the American tropics. (Urban, Add. 3: 309.)

Boje. See *Antirrhoea coriacea.*

A wild tree not infrequently met with in the northeast part of the island. Not more than 45 or 50 feet (14 or 15 meters) in height, with a straight trunk 18 to 24 inches (45 to 60 centimeters) in diameter. It furnishes a heavy durable wood, very strong and much appreciated for carpenter work, furniture, framework of houses, etc., yellow in color, brittle, breaking horizontally. Also called "quina" and referred to *Coutarea coccinea*, a species that does not appear in Index Kewensis. (Grosourdy, 2: 367.)

Bombija. See *Cardiospermum halicacabum.*

Boniato.

A tree from all parts of the island; height 10 to 12 feet (3 to 3.7 meters); diameter 12 to 15 inches. Wood, dark, streaked with yellow; hard; specific gravity, 0.049 (1.049?); used in cabinetmaking. (Exp. 1857.)

Borreria parviflora. See *Spermacoce ocymoides.*

Borreria podocephala. See *Spermacoce verticillata.*

Borrichia arborescens. CLAVELON DE PLAYA.

A biennial composite shrub. (Stahl, **5:** 134.)

Boton blanco. See *Spermacoce verticillata.*

Boton blanco de arenales. See *Spermacoce verticillata.*

Botoncillo. See *Spermacoce ocymoides.*

Boton de cadete. See *Leonotis nepetaefolia.*

Boton de oro. See *Clerodendron aculeatum.*

Bottle gourd. See *Lagenaria vulgaris.*

Bougainvillea spectabilis. TRINITARIA.

A showy climbing shrub, belonging to the family Nyctaginaceae. Its striking appearance is due to the large purplish pink bracts, the true flowers being yellowish and quite small. The color is extremely conspicuous, and to some it appears painfully "loud." In Porto Rico a quite different plant, *Antigonum leptopus*, producing similar large masses of brilliant color, though of a more pleasing shade of pink, has been mistaken for Bougainvillea by travelers and popular writers.

Bourreria domingensis. ROBLE GUAYO. BURERIA.

Family Boraginaceae; a shrub or small tree reported by Stahl from the vicinity of Quebradillas. (Stahl, **6:** 99.)

Bourreria succulenta. ROBLE GUAYO. BURERIA.

A small indigenous tree growing in the forests near the coast. It is said to strikingly resemble *Cordia elliptica* in both habit and inflorescence. (Stahl, **6:** 97.)

Boussingaultia baselloides. MADEIRA VINE. SUELDA CON SUELDA.

Family Chenopodiaceae; a slender vine commonly cultivated and trained over arbors. Supposed at Cataño to have medicinal value in rheumatism.

Brachyramphus caribaeus. See *Lactuca intybacea.*

Bradburya laurifolia. CONCHITA LAURIFOLIA.

A leguminous plant reported by De Candolle as occurring in pastures in Porto Rico; not known by Stahl. (Stahl, **3:** 64.)

Bradburya plumieri. CONCHITA DE PLUMIER.

A wild vine. (Stahl, **3:** 60.)

Bradburya pubescens. CONCHITA PELUDA.

A wild annual vine growing in waste places. (Stahl, **3:** 61.)

Bradburya virginiana. CONCHITA VIRGINIA.

A slender, wild, annual vine growing in all parts of the island. (Stahl, **3:** 62.)

Brasil.

A tree from all parts of the island; height, 25 to 30 feet (8 to 10 meters); diameter, 5 to 6 inches (12 to 15 centimeters). Wood, dark, hard; specific gravity, 1.099; used in making a dye. (Exp. 1857.)

Brasil de costa.

A tree from the south part of the island; height, 25 to 30 feet (8 to 10 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood, yellow, hard; specific gravity, 0.671; used in making planks and joists. (Exp. 1857.)

Grosourdy refers this to *Caesalpinia cristata*, a species that does not appear in Index Kewensis. He may possibly refer to *C. crista*, a West Indian species.

A tree 30 feet (10 meters) high, with a naked, crooked trunk, 25 inches (62 centimeters) in diameter. The wood is rather compact, heavy, hard, and strong. In color much darker than *C. bijuga*, and used for the same purposes. Used also in Porto Rico for boards and beams in country houses. (Grosourdy, **2:** 367.)

Brasilete.

Enumerated by Hill among trees used for dyeing and tanning. In Cuba the name is applied to *Caesalpina pectinata* and other related species. In Stahl's Flora "palo de brasilete" is *Ecastophyllum monetaria*, a leguminous shrub, 6 to 12 feet (2 to 4 meters) high. Grosourdy refers it to *Caesalpinia bijuga.*

Brassica juncea. MOSTAZA.

An annual cruciferous weed, sometimes cultivated and used in medicine as a substitute for mustard. Bello reports this common name for *Sinapis brassicata.* (Stahl, **2**: 184.)

Brassica napa. TURNIP.

The turnip is very little cultivated in Porto Rico. In the market at San Juan very small ones were selling at four for 1 cent.

Brassica oleracea. CABBAGE. COL.

The cabbage is a temperate vegetable very popular in tropical conntries, and generally cultivated on a small scale in private gardens, in spite of the fact that only indifferent success is attained. The plants mostly fail to form heads or produce only a small and loose cluster of leaves. Under very favorable circumstances and by using good seed of early varieties it is occasionally possible to attain somewhat better results, but at the time of our visit cabbages from the United States were selling at half a peso (30 cents) apiece, no competition being afforded by the insignificant home-grown vegetable. With better care and better seed the latter can undoubtedly be improved, but the importation of American cabbages at lower prices may be expected to greatly increase.

For cultivation in the tropical garden the variety of cabbage called collards is generally more satisfactory than the sorts usually grown in the North. This variety does not head, but the leaves are more delicate than the outer leaves of cabbage and make very acceptable and wholesome "greens." It will flourish where cabbages can be produced only with difficulty or not at all, with the additional advantage of growing as a perennial and thus remaining available for food during most of the year.

Brazil nut. See *Bertholletia excelsa.*

Bread fruit. See *Artocarpus communis.*

Bretonica. See *Chaptalia integrifolia* and *Valerianodes.*

Bretonica afelpada. See *Melochia tomentosa.*

Bretonica aserrada. See *Melochia serrata.*

Bretonica peluda. See *Melochia hirsuta.*

Bretonica piramidal. See *Melochia pyramidata* and *M. nodiflora.*

Bretonica prieta. See *Melochia nodiflora.*

Brigueta. See *Ilex dioica.*

Brigueta naranjo. See *Ilex macoucoua.*

Bromelia pinguin. PINGUIN. PIÑUELA.

A wild relative of the pineapple, found everywhere at lower elevations in Porto Rico, and often planted for hedges. The margins of the leaves have sharp, cutting spines, mostly curved upward, but often reversed so that even the most casual contact is likely to result in a wound. It was Bromelia which added so much to the difficulty of operations about Santiago, and a hedgerow of it is indeed a formidable obstacle for men or horses.

The pulp inclosing the seeds has a pleasant, slightly acid taste somewhat suggesting the pineapple; it is also used as an anthelmintic. Like those of the true pineapple and most other members of the present family, the leaves contain a fine fiber which might be utilized if obtainable in good condition and in sufficient quantity. In the present species, however, the fibers have been found to have a gummy coating which increases the difficulty of preparation, so that experiments in commercial production have not been successful. Other South American Bromeliaceae have cleaner fibers which have been shipped to Europe in considerable quantities, but the industry has remained on a rather precarious basis.

In the discussion of the pineapple, attention has been called to the fact that in Porto Rico Bromelia is the host plant of a mealy bug which also infests the pineapple, to which it is probably carried by the ants. If the pest should prove serious it may be found necessary to exterminate Bromelia in regions devoted to pineapple culture.

Bruja. See *Bryophyllum calycinum.*

Brunfelsia densifolia.

Family Solanaceae; an indigenous tree, 8 to 40 meters in height, from the vicinity of Maricao. (Urban, Symb. **1:** 402.)

Secured by Sintenis near Maricao.

Brunfelsia lactea. Vega blanca.

A shrub, sometimes reaching 6 meters; reported from Luquillo, Naguabo, and Cayey. (Urban, Symb. **1:** 401.)

Brunfelsia portoricensis.

A shrub of 3 meters; known only from the Sierra de Luquillo. (Urban, Symb. **1:** 400.)

Bryophyllum calycinum. Bruja.

Family Crassulaceae. In Cuba this plant has several names—"hoja bruja," "inmortal," "polipo herbacea," "siempreviva," and "vivora,"—all referring to its great tenacity of life, small pieces and even single leaves sending out new growth when suspended in a moist atmosphere. Buds arise from the notches of the leaves. It is this plant, a common tropical weed, which recently received the distinction of a letter from a consular officer which was published by the State Department and resulted in numerous inquiries from all parts of the country. It has long been known in cultivation, on account of its extreme hardiness, but seldom flowers outside the Tropics, where it seems to thrive best when growing in crevices of bare or slightly shaded rocks; in such situations it flowers abundantly in the dry season. (Stahl, **4:** 191.)

Bucago. See *Erythrina glauca.*

Bucare. See *Erythrina micropteryx* and *E. umbrosa.*

According to Captain Hansard the "bucare" of Porto Rico is the same as the tree called "madre de cacao" used for shade in the cacao growing districts of Venezuela and Trinidad, because of its extremely rapid growth, as much as 10 feet (3 meters) per year. It is also said to be called "immortelle" in the French islands. The South American species is supposed to be *E. umbrosa*, but according to Urban this is not known from the islands north of Trinidad, its place being taken by *E. micropteryx*, which is also found in Porto Rico. Hucar, jucar, ucar, and ucare are supposed to be variations of bucare, but another quite different tree (*Bucida buceras*) was pointed out to us under those names.

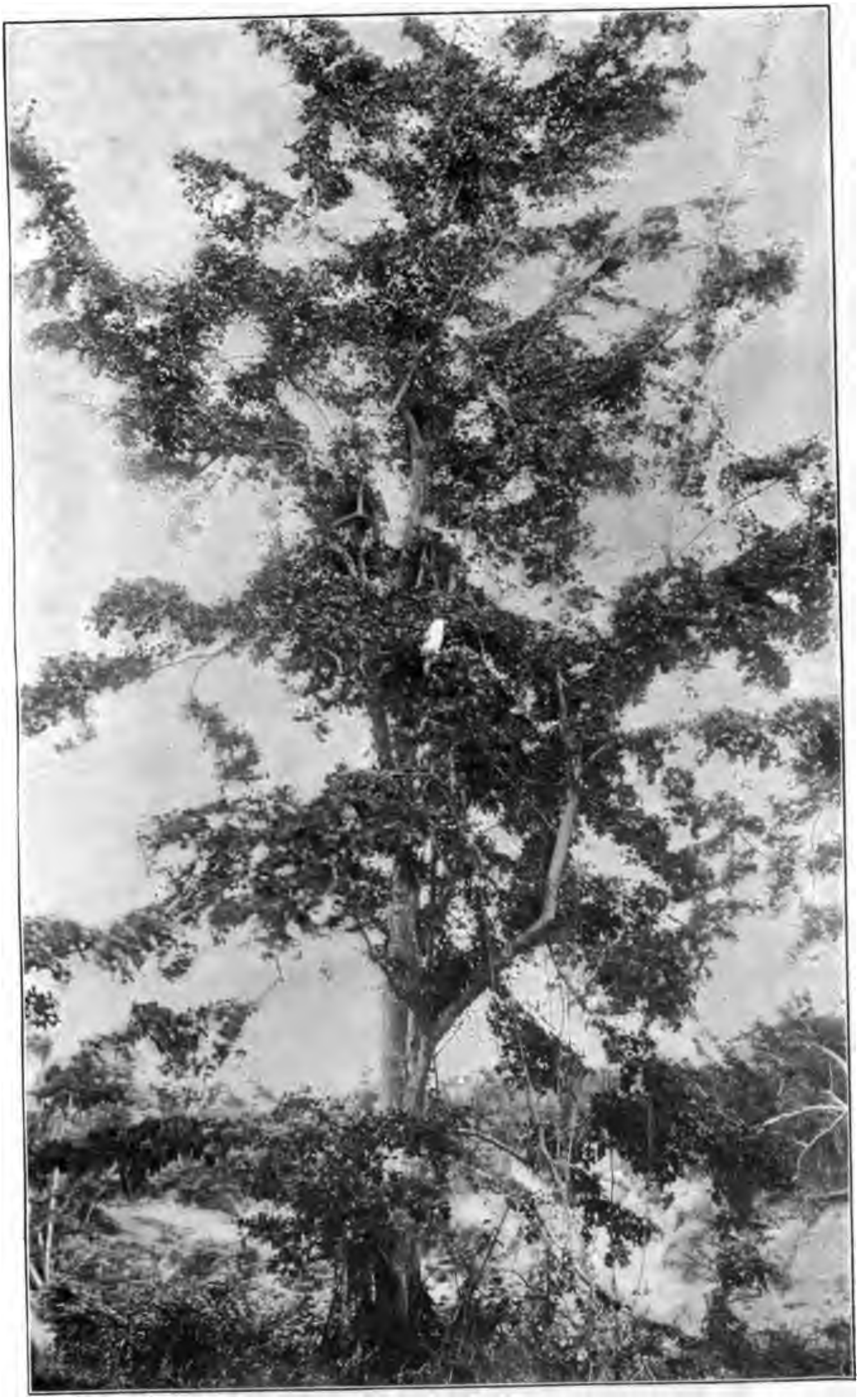
Buchnera elongata. Espiga de San Antonio.

Family Scrophulariaceae; a stiff, scarcely branched herb, growing on inundated sandy soil. (Stahl, **6:** 229.)

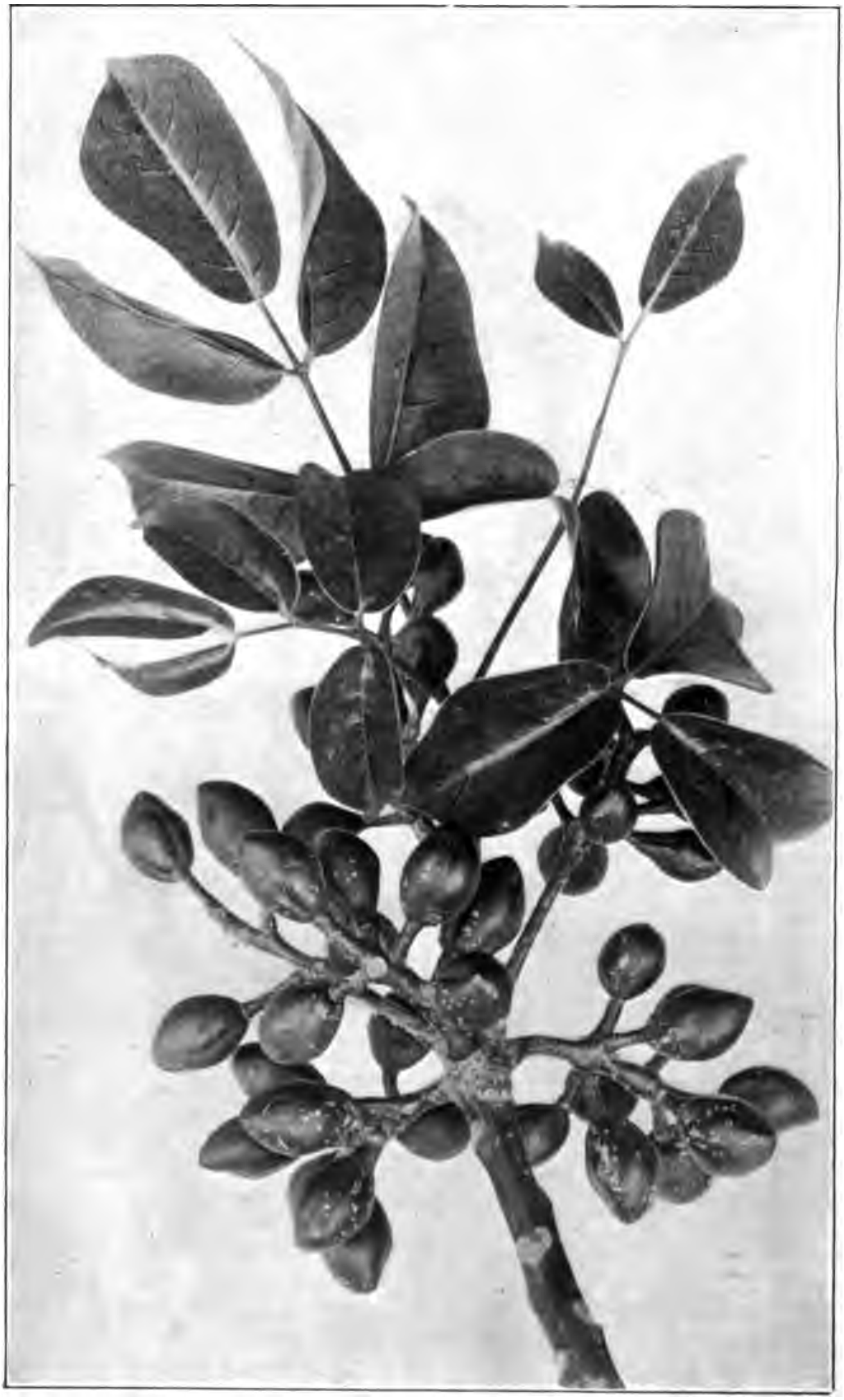
Bucida buceras. Ucar. Plate XX.

Family Combretaceae; a large tree noted at several points on the south side of the island; specimens from Coamo Springs (No. 714). (Stahl, **4:** 140.)

A wild tree abundant in all parts of this and other islands of the West Indies; 24 to 80 feet high, with a straight trunk 4 to 5 inches in diameter. It furnishes a



UCAR TREE (BUCIDA BUCERAS). COAMO SPRINGS.



ALMACIGO (BURSERA SIMARUBA). COAMO SPRINGS.

yellowish white wood, very strong and flexible, commonly used for shelves in houses and for mallets and wooden cogs; also used for knees in boat building. Native name "hucar blanco." (Grosourdy, 2:390.)

Under the native name "ucar," on page 362, the same author describes the wood of this species as olive-colored, more or less dark, with stripes and undulations, and adds that from its compact and fine-grained texture it would appear suitable for polishing. It has, however, the defect of cracking easily. Specific gravity, 1.009.

Buenoceo.

Spelling doubtful; applied at Caguitas to *Thunbergia erecta.*

Buenos dias. See *Hibiscus bifurcatus.*

Bullock's heart. See *Anona reticulata.*

Bully tree.

A name used in the British West Indies, according to Grisebach, for *Sapota sideroxylon*, *Myrsine laeta*, and several species of Dipholis.

Bumelia krugii.

Family Sapotaceae; a recently described species from the vicinity of Guanica.

Bunchosia glandulifera.

Family Malpighiaceae; from Sierra de Jabucoa and Añasco, in cultivation.

Bunchosia glandulosa.

From Guanica, Peñon, and near Ponce. A variety (*latifolia*) is known from Fajardo and Peñuelas. *Bunchosia nitida* is reported from Guanica.

Bureria. See *Bourreria.*

Burro. See *Capparis portoricensis.*

Burro blanco. See *Capparis portoricensis.*

Bursera gummifera. See *Bursera simaruba.*

Bursera simaruba. ALMACIGO. PLATE XXI.

This species, better known as *Bursera gummifera*, is one of the commonest and most characteristic trees of Porto Rico. It is native in the forests of the limestone foothills, where it grows to considerable size, but is more conspicuous as a shade tree extensively planted along the improved roads, especially on the south side of the island. It may be recognized at once by the thin reddish bark, which loosens in shreds and sheets like that of some species of cherry and birch, and is on this account called "West Indian birch" in some of the British islands. As in case of the jobo tree (*Spondias lutea*) cuttings root readily, even when large stakes are used, rendering these species very easy of propagation, and accordingly popular for fence posts and similar uses requiring permanence. As a shade tree Bursera is seldom a success, the top being too small and irregular. Even when still young it fruits abundantly. The wood is soft and of little value.

Bursera simaruba is the largest tree of the thin forest growth which covers the dry limestone hills of the south side of the island. This is composed mostly of slender Leguminosae—Pictetia, *Pithecolobium unguis-cati*, and several others.

In some islands a somewhat aromatic sweetish balsam, supposed to have medicinal properties, is obtained from this species. According to Engler this is dried down to a sort of resin and goes into export trade as chibou, cahibou, or gomart, but it is not stated where these names are used. The leaves, bark, buds, and roots are also believed to have medicinal properties.

Button tree. See *Conocarpus erecta.*

Buxus vahlii.

Family Buxaceae; from Rincon, in thickets near the shore.

Byrsonima crassifolia.

Family Malpighiaceae; a tree collected near Mayaguez by Mr. Heller.

Byrsonima lucida. PALO DE DONCELLA.

Also called "sangra de doncella," according to Stahl, who considers the Porto Rican form a distinct variety or species, which he names *B. portoricensis*, but this suggestion seems not to have been noticed by other botanists. The plant is an indigenous shrub, or small tree, belonging to the Malpighiaceae, and having the branches and inflorescence covered with a yellow powder. It grows close to the shore to the east of San Juan, and blossoms in the winter. The timber is durable, but not of sufficient diameter to render it important.

Byrsonima portoricensis. See *Byrsonima lucida.*

Byrsonima spicata. MARICAO.

A tree 30 to 40 feet (9 to 13 meters) high. The bark is used for tanning. The yellow, acid berries are said to be eaten, although rather astringent. (Stahl, **2**: 140.) It furnishes a wood of good weight and ordinary durability. This is compact, uniform, fine-grained, and somewhat fibrous in texture, and cinnamon-brown in color, with narrow parallel light stripes. The wood is strong and much appreciated; used in the country for boards and framework of houses, etc. Specific gravity, 0.812. Native name, "doncella." (Grosourdy, **2**: 372.)

Caballo asi. See *Abelmoschus abelmoschus.*

Cabalonga. See *Thevetia neriifolia.*

Cabbage. See *Brassica oleracea.*

Cabbage-bark. See *Andira inermis.*

Cabbage palm.

The "palm cabbage" is obtainable from many different palm trees, and consists of the delicate tissues of the newly-formed, unexpanded leaves. In the West Indies the name is more properly applied to *Oreodoxa oleracea*, a native of Barbados and other southern islands, though apparently extending to Porto Rico if specimens collected by Sintenis in the Luquillo Mountains were from native trees and are properly determined.

Cabbage tree. See *Andira inermis.*

Cabellos de Angel. See *Clematis dioica.*

Cabambreña.

A tree from all parts of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood white, soft; specific gravity, 0.799; not used. (Exp. 1857.) Perhaps this is an error for "calambreña."

Cabo de hacha. See *Trichilia hirta* and *T. simplicifolia.*

Cabo negro. See *Arenga saccharifera.*

Cabra.

A tree from all parts of the island; height, 25 to 35 feet (8 to 11 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood light red, soft; specific gravity, 0.597; used for weather boards. (Exp. 1857.) (Grosourdy, **2**: 368.)

Cacaillo. See *Sloanea berteriana* and *Meliosma obtusifolia.*

Cacao. See *Theobroma cacao.*

Cacao bobo. See *Meliosma obtusifolia* and *M. herbertii.*

Cacao cimarron.

According to Captain Hansard a tree of great height, not resembling the true cacao. It has large, coarse, brittle leaves. The wood has a specific gravity of 1.08, and is used for firewood and walking sticks.

Cacao de monte.

A tree from the interior of the island; height, 40 to 44 feet (12 to 14 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood light-colored, rather hard; specific gravity, 0.964; not used. Also called "cacao macho." (Exp. 1857.)

Cacao hembra.

A tree from the interior of the island; height, 25 to 30 feet (8 to 10 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood light-colored, rather hard; specific gravity, 0.817; little used. (Exp. 1857.)

Cacao macho. See *Cacao de monte.*

Cacao motillo. See *Sloanea berteriana.*

Cacao rojo. See *Sarcomphalus reticulatus.*

Cacao roseta. See *Sloanea berteriana.*

A tree from the interior of the island; height, 35 feet (11 meters); diameter, 30 to 40 inches (75 to 100 centimeters). Wood white, soft; specific gravity, 0.488; not used. (Exp. 1857.)

Cachimbo. See *Palicourea crocea.*

Cachimbo verde. See *Palicourea umbellata.*

Cadillo. See *Corchorus hirsutus* and *Urena lobata;* also see under "çaïllo."

Cadillo altea. See *Triumfetta althaeoides* and *T. semitriloba.*

Cadillo anaranjado. See *Pavonia coccinea.*

Cadillo de ciénega. See *Pavonia racemosa.*

Cadillo espinoso. See *Pavonia spinifex.*

Cadillo pata de perro. See *Urena sinuata.*

Cadillo pequeque. See *Pavonia typhalea.*

Cadungo amargo. See *Lagenaria vulgaris.*

Caesalpinia bijuga. BRASILETE.

A small tree found on the coast, 9 to 15 feet (3 to 5 meters) high, with a trunk 18 inches (45 centimeters) in diameter. The wood is very compact, very hard, dark reddish orange in color, and breaks vertically with difficulty. The bark is rather thick, It is utilized in Europe as a dye. It serves also for turning and to make violin cases. (Grosourdy, **2:** 367.)

Caesalpinia bonduc. MATO AZUL.

Bello reports the common name, "matos de playa," for this species. (Stahl, **3:** 120).

Caesalpinia bonducella. MATO AMARILLO.

A much-branched leguminous shrub, 3 to 4 meters high, frequenting the coast. (Stahl, **3:** 121.) The seeds of this species were on sale in the market of Ponce as a remedy for piles. See notes under "mato colorado" and "tortera."

Caesalpinia coriaria. DIVI-DIVI.

A leguminous tree, the pods of which are very rich in tanning and dying material, and constitute a considerable article of export from the West Indies and South America. The species is not included in Stahl's Flora, but is mentioned by Hill, though without anything to show that he established its existence in Porto Rico. Whether already introduced or not, it is probable that the planting of it on a somewhat extensive scale is worthy of serious consideration

Caesalpinia gilliesii.

Reported from Guanica.

Caesalpinia sepiaria. ZARZA DE CERCAS.

Of shrubby growth; used for fences in Cuba. (Stahl, **3:** 122.)

Café. See *Coffea arabica.*

Café de la India. See *Murraya exotica.*

Caffeillo. See *Drypetes alba* and *D. glauca.*

Evidently another spelling of "cafetillo." According to Captain Hansard caffeillo is a wood having a specific gravity of 0.85 and is not much used. The flowers are fragrant.

Cafetillo. See *Casearia nitida* and *Faramea odoratissima.*

A tree from the interior of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 15 inches (37 centimeters). Wood yellowish, hard; specific gravity 0.840; used for lumber. (Grosourdy, **2**: 368.) (Exp. 1857.)

Caillo.

Probably intended for "cadillo." At Santurce *Corchorus hirsutus* and *Xanthium canadense*, and at Quebrada Arenas *Triumfetta semitriloba* were called "caillo."

Caimitillo. See *Chrysophyllum monopyrenum* and *C. glabrum.*

A tree from all parts of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood, white, hard; specific gravity, 0.012 (1.012?); used in making laths. (Exp. 1857.)

Captain Hansard says that the wood is used for shingles and barrel staves. The tree is similar to the star-apple or caimito, but the fruit is only half the size.

Grosourdy gives this as the common name in Porto Rico and Cuba of *Chrysophyllum microphyllum* and *C. oliviforme.* Both of these names are treated as synonyms of *C. monopyrenum* and *C. caimito.* He describes it as a tree growing wild and reaching 40 to 45 feet (12 to 14 meters) in height, with a trunk 18 to 20 inches (45 to 50 centimeters) in diameter. Furnishes a wood of good weight and more than ordinary durability, rather compact and fibrous in texture and rather fine-grained. Dirty white in color or sometimes somewhat chocolate. The wood is used ordinarily for shingles and bowls. It might also be used for carpenter work. (Grosourdy, **2**: 368.)

Caimito. See *Chrysophyllum cainito.*

A tree from all parts of the island; height 30 to 35 feet (9 to 11 meters); diameter 10 to 12 inches (25 to 30 centimeters). Wood, violet; hard; specific gravity, 0.194; little used. (Exp. 1857.)

Cainito. See *Chrysophyllum cainito.*

According to Captain Hansard the specific gravity is 0.85.

Cajanus bicolor. See *Cajanus cajan.*

Cajanus cajan. GANDUL.

Family Leguminosae; perennial shrub growing from 3 to 10 feet (1 to 3 meters) high, but treated as an annual in cultivation. Bello calls *Cajanus bicolor* "gandures." (Stahl, **3**: 55.)

Cajou. See *Anacardium occidentale.*

Cakile aequalis. See *Cakile maritima.*

Cakile maritima. MOSTACILLA DEL MAR.

A seaside herbaceous plant related to mustard; the common name means "sea-mustard." (Stahl, **2**: 37.)

Calabash nutmeg. See *Monodora myristica.*

Calabash tree. See *Crescentia cujete.*

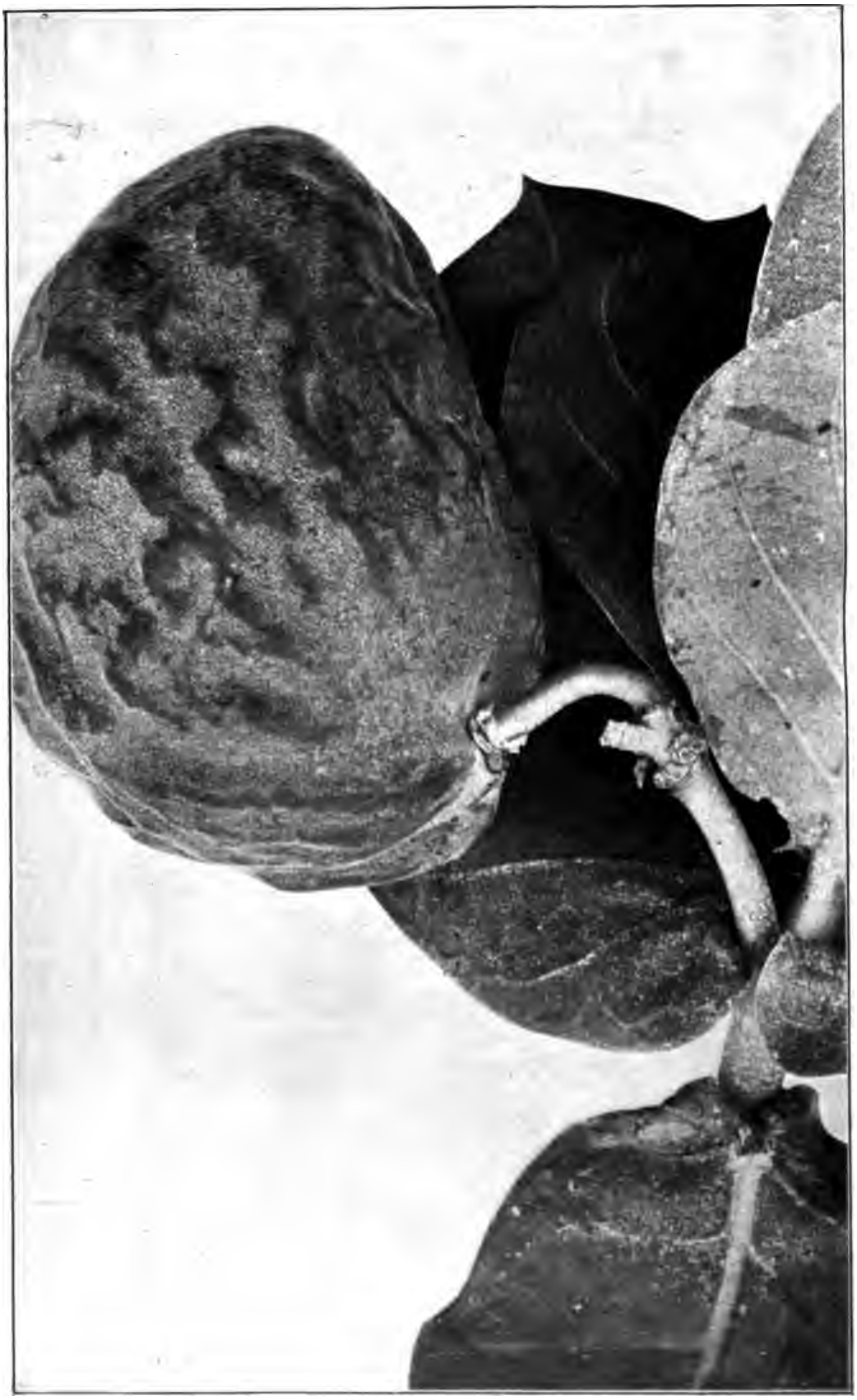
Calabaza. See *Cucurbita pepo.*

Caladium. CARA DE CABALLO.

An ornamental Caladium was called by this common name, meaning "horse face," at Cataño.

Caladium esculentum. See *Colocasia esculenta.*

Calambrena. See *Coccolobis nivea.*



ALGODON DE SEDA (CALOTROPIS PROCERA). ROAD NEAR GUAYAMA.

Caldo santo. See *Argemone mexicana.*

The local mispronunciation of cardosanto.

Calliandra portoricensis. ACACIA PUERTORIQUEÑA.

A white-flowered leguminous shrub, rare on the north side of the island. Our specimen (no. 481) was collected along the road between Cayey and Guayama. (Stahl, **3**: 156.)

Calliandra saman. See *Pithecolobium saman.*

Callicarpa ampla. CAPA ROSA.

A verbenaceous shrub or small tree; specimens were collected by Sintenis at Utuado. Grisebach used the name *Petitia domingensis.* (Stahl, **6**: 221.)

Calocarpum mammosum.

Family Sapotaceae, the variety *occideum* is identified by Pierre from Utuado (Sintenis). In Engler this genus is treated under Lucuma.

Calonyction megalocarpon. See *Ipomea bona-nox.*

Calophyllum calaba. PALO DE MARIA.

Family Clusiaceae; a tree 60 feet (18 meters) high. The oil pressed from the seeds is said to be used in lamps. Specimens are known from Manati and Rinçon. Bello calls this species "marias." (Stahl, **3**: 125). Grosourdy (**2**: 403) varies the native name to "maria" and describes the plant as a handsome wild tree with a dense top, 55 to 60 feet (17 to 18 meters) high, and a long straight trunk 3 feet (1 meter) or more in diameter. The wood is lasting, rather light, soft, fibrous in texture, reddish in color, rather lighter than mahogany. Specific gravity, 0.655. This wood is highly appreciated for carpenter work and the trunks, when large, serve to make canoes. Planted in rows this tree is sometimes used in parks. If the lower limbs are cut off the tree will make a straight growth, This operation should be repeated every seven years, and each time a good top should be left.

Calopogonium caeruleum. JÍCAMA.

A leguminous vine known from Mexico, Peru, and Brazil. (Stahl, **3**: 69, as *Stenolobium caeruleum.*)

Calopogonium orthocarpium.

A small vine with hairy pods; cabo rojo.

Calotropis procera. ALGODON DE SEDA. PLATE XXII.

Also called "mata de seda." Family Asclepiadaceae; a shrub or small tree said to attain a height of 5 meters in favorable situations. The fibers of the seeds are twisted into thread by some of the African tribes; the bark is also used as a medicine, and from the milk an inferior rubber or rubber adulterant has been obtained. This species is native in the tropics of Africa and Asia, but has been introduced and widely disseminated in America. According to Stahl (**6**: 86) the height is but 6 feet. Specimens planted along the lower part of the Guayama road are 12 to 15 feet (4 to 5 meters) high, but are bushy rather than tree-like. The leaves are white or grayish with a heavy bloom, and its whole appearance is that of a large milkweed. From the Cape Verde Islands the silk of this milkweed is exported in small quantities as "kapok," the more common source of which is the ceiba or "tree cotton."

Calyptranthes chytraculia. See *Calyptranthes sintenisii.*

Calyptranthes krugii.

Family Myrtaceae; specimens were collected by Sintenis in the vicinity of Luquillo.

Calyptranthes sintenisii. HOJA MENUDA.

Native names: "Limoncillo" and "limoncillo de monte." A myrtaceous shrub or small tree indigenous in Porto Rico, Santo Domingo, and Martinique. Reported from Luquillo and Anasco. (Urban, Add. **2**: 116.)

This is probably the "limoncillo" which Grosourdy identifies as *Calyptranthes paniculata*, a Peruvian species not likely to occur in Porto Rico. A wild tree 50 or 60 feet (15 or 18 meters) high, with a trunk 18 inches (45 centimeters) in diameter. The crushed leaves have the odor of lemons. The wood is very hard, flexible, and violet-colored. It breaks with difficulty with a vertical fracture. Its common use is for shelving, door cases, etc. Specific gravity, 1.112. (Grosourdy, **2**: 394.)

Calyptropsidium sintenisii.

A small tree, 15 to 25 feet (5 to 8 meters) high, related to the guava; known only from the forests along the crest of El Yunque.

Camacey. See *Tamonea prasina.*

Camacey-almendro. See *Tamonea integrifolia.*

Camacey blanco. See *Tamonea fothergilla.*

Camacey colorado. See *Tamonea impetiolaris.*

Camacey de charcos. See *Acisanthera quadrata.*

Camacey de ciénega. See *Nepsera aquatica.*

Camacey de paloma. See *Tamonea laevigata* and *Sagraea fascicularis.*

Camacey-Mariana. See *Rhexia mariana.*

Camacey negligente. See *Clidemia neglecta.*

Camacey peludo. See *Clidemia hirta.*

Camacey racemoso. See *Tamonea racemosa.*

Camacey simple. See *Henriettella fascicularis.*

Camacey-Tomaso. See *Tamonea thomasiana.*

Camandula. See *Coix lachryma.*

Camasey.

Presumably an erroneous spelling of camacey.

Cambrón. See *Casearia ramiflora* and *Randia aculeata.*

Cambures.

A variety of banana mentioned by Hill.

Cambustera. See *Quamoclit quamoclit.*

Cambutera. See *Quamoclit quamoclit* and *Q. coccinea.*

Cambutera de costa. See *Ipomea filiformis.*

Camocuy blanco.

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 6 to 8 inches (15 to 20 centimeters). Wood, white, rather hard; specific gravity, 0.807; used in building houses. Also known as "camocuy puz." (Exp. 1857.)

Camocuy colorado.

A tree from all parts of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 6 to 8 inches (15 to 20 centimeters). Wood, pinkish, very soft; specific gravity, 0.80; used in making houses. (Exp. 1857.)

Camocuy prieto.

A tree from all parts of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 6 to 8 inches (15 to 20 centimeters). Wood, white, rather hard; specific gravity, 0.804; used in making houses. (Exp. 1857.)

Camocuy puz. See *Camocuy blanco.*

Campana de Paris. See *Datura suaveolens.*

Campanilla. See *Sphenoclea zeylanica.*

Campeachy wood. See *Haematoxylon campechianum.*

Caña de azucar. See *Saccharum officinarum.*

Caña de Castilla.

In Cuba applied to the grass *Gynerium saccharoides.*

Caña de la India.

Also called wild cane, "caña cimarron." The juice is squeezed out and used as an emetic. In the market of Ponce the roots of "caña india" were on sale for use in the preparation of a refreshing drink.

Cañafistolo. See *Cassia fistula* (another spelling of Cañafistulo.)

A tree from the interior of the island; height, 60 to 70 feet; diameter, 3 to 9 inches. Wood red, hard; specific gravity, 1,193; little used. (Exp. 1857.)

Cañafistula.

The fruit of *Cassia fistula.*

Cañafistula cimarrona. See *Cassia grandis.*

Cañafistulo. See *Cassia fistula.*

Canario. See *Allamanda cathartica.*

Canavalia ensiformis. SWORD BEAN.

A leguminous woody vine, bearing long pods and white beans. In Africa the young pods and beans are eaten.

Canavalia obtusifolia. MATO DE LA PLAYA.

A woody vine. (Stahl, **3**: 81.)

Canavalia rusiosperma. MATO COLORADO.

A large leguminous climbing vine, attaining a thickness of 10 cm. and ascending the highest forest trees; from Maricao and Quebradillas. (Urban, Symb. **1**: 474.) The seeds of this species are red, and are probably the ones used with those of *Caesalpinia bonducella* as a magical remedy for piles. See note under that species, also that under "tortera."

Candle wood. See *Oreopanax capitatum.*

Canela.

Supposed by Captain Hansard to be cinnamon, but neither *Cinnamomum zeylanicum*, the true cinnamon, nor *C. cassia*, the Chinese cinnamon, are known from the island. The specific gravity, as given by Captain Hansard, is 0.87.

A tree from the interior of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 10 to 12 inches (25 to 30 centimeters); wood dark, hard; specific gravity, 0.956; used in making country houses. (Exp. 1857.)

A wild tree, 35 to 40 feet (11 to 12 meters) high, with a trunk 12 inches (30 centimeters) in diameter. The wood is dark-colored, rather hard, and used in country houses. Specific gravity, 0.515. (Grosourdy, **3**: 369.)

Canelilla.

A tree from the interior of the island; height, 35 to 40 feet (10 to 12 meters); diameter, 10 to 12 inches (25 to 30 centimeters); wood greenish, rather hard; specific gravity, 0.897; used in making country houses. (Exp. 1857.) A wood of this name is noted by Captain Hansard with a specific gravity of 0.60.

Canella alba. BARBASCO. WILD CINNAMON.

Family Canellaceae; a tree 10 to 15 feet (3 to 5 meters) high. The pale, orange-colored bark has an aromatic odor and is used as a tonic. Specimens were collected by Sintenis at Rincon. (Stahl, **2**: 127.)

Canelo.

A tree from the interior of the island; height, 15 to 20 feet (5 to 6 meters); diameter, 10 to 12 inches (25 to 30 centimeters); wood dark, rather hard; specific gravity, 0.874; used in making country houses. (Exp. 1857.)

Canna.

Several species of Canna grow wild in Porto Rico; whether they are indigenous or have escaped from cultivation is not evident. At Cataño the name "maraga" was applied to *C. edulis* or *C. indica.*

Capá blanca. See *Petitia domingensis* and *Cordia alba.*

Color, clear light brown. Very numerous ducts, occurring singly, and evenly diffused between the medullary rays. The latter numerous, in distinct parallel lines. Structurally similar on the radial section to American beech, the medullary rays giving a beautiful, fine-mottled, satiny appearance. Tangential section unattractive. Straight-grained and suitable for interior finish. Used for rollers in coffee-hulling mills. (Hill and Sudworth.)

According to Hill "capá blanca" is *Cordia alba*, but this identification is not seconded, and Stahl gives *Petitia domingensis* as above. Possibly the Cordia identification was inferred from the fact that "capá prieta" is *Cordia gerascanthus.*

A tree from the interior of the island; height, 65 to 70 feet (19 to 21 meters); diameter, 30 to 35 inches (75 to 87 centimeters). Wood white, very hard; specific gravity, 0.955; used in boat building. (Exp. 1857.)

Captain Hansard gives the specific gravity as 0.89.

Capá prieta. See *Cordia gerascanthus* and *C. gerascanthoides.*

A tree from the interior of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood light-colored, very hard; specific gravity, 0.899; used in boat building. (Exp. 1857.)

Captain Hansard gives the specific gravity as 0.75.

Color, rich light brown, with darker streaks and mottlings. Very numerous ducts, occurring singly or irregularly, aggregated in twos and threes between the medullary rays. Medullary rays numerous, indistinct, straight, parallel lines. Wood fibers interlaced, but wood appearing to be straight-grained. Radial section structurally similar to capá blanca. Tangential section somewhat similar to dark heartwood of American elm. Handsome wood for interior finish. Used for flooring. (Hill and Sudworth.)

Capá rosa. See *Callicarpa ampla.*

Capá sabanera.

A tree from the interior of the island; height, 55 to 60 feet (16 to 18 meters); diameter, 12 to 15 inches (30 to 40 centimeters). Wood dark, very hard; specific gravity, 0.978; used in boat building. (Exp. 1857.)

Described by Grosourdy as a wild tree, reaching 30 feet (9 meters) in height, with a trunk 12 inches (40 centimeters) in diameter and furnishing a wood of good weight, hard and strong, dark in color and used in the construction of country houses and for fences. (Grosourdy, **2:** 370.)

Capacillo.

According to Captain Hansard this tree grows with "yaiti" on the calcareous foot hills and does not become large. The wood is very hard and has a specific gravity of 0.82, but is used for little except fire-wood. Perhaps the same as "capaillo."

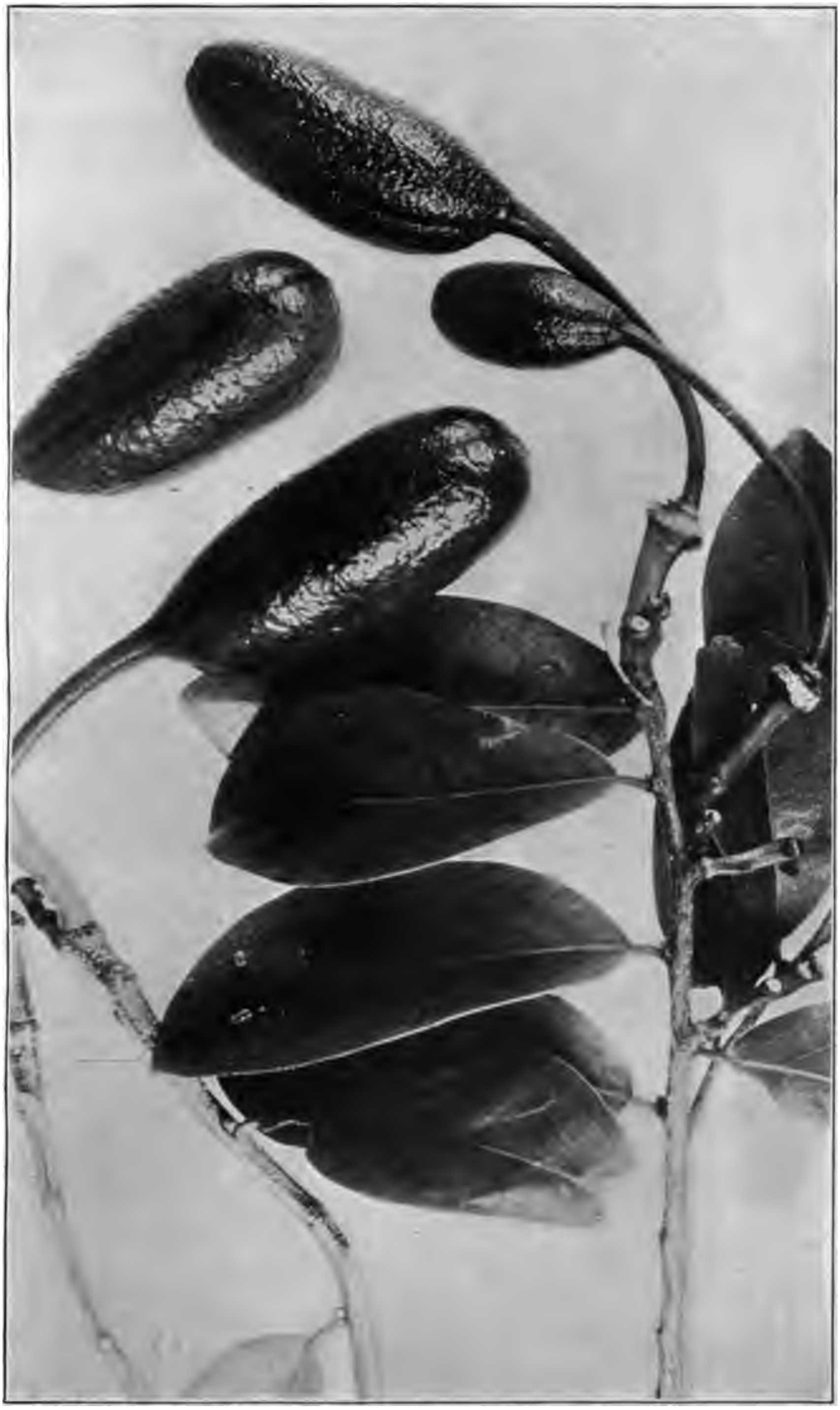
Capaillo. See *Aegiphila martinicensis.*

Capitana. See *Dendropremon caribaeus.*

Capitaneja. See *Verbesina alata.*

Capparis cynophallophora. PALO DE BURRO. **PLATE XXIII.**

Family Capparidaceae; a shrub or tree 8 to 25 feet (1.5 to 8 meters) high, found along the coast. Collected by Sintenis in the vicinity of Guanica; said to be a specific for dropsy. (Stahl, **2:** 44.)



PALO DE BURRO (CAPPARIS CYNOPHALLOPHORA); FRUIT AND LEAVES.

Bello reports seven varieties of this species from the southwestern part of the island. (Bello, p. 236.)

Capparis frondosa. PALO DE BURRO.

A shrub 3 or 4 meters high, reported from Sabana Grande and Manati. (Stahl, **2**: 47.)

Capparis jamaicensis. BEJUCO INGLES.

A shrub 6 to 10 feet (2 to 3 meters) high. (Stahl, **2**: 185.)

Capparis latifolia. PALO DE BURRO.

Very similar to *C. cynophallophora*, but with the flowers in racemes. (Stahl, **2**: 186.)

Capparis portoricensis. BURRO BLANCO.

A tree of 15 to 20 meters, known from Coamo, Peñuelas, San German, and Guanica. (Urban, Symb. **1**: 309.)

Capparis verrucosa. PALO DE BURRO.

A tree 5 to 6 meters high, the largest of the Port Rican species. (Stahl, **2**: 45.)

Capraria biflora. GOAT WEED. TÉ.

Family Scrophulariaceae. A small shrub, less than 4 feet (1.3 meters) high. Bello calls this "té del pais." (Stahl, **6**: 227.)

Capriola dactylon. BERMUDA GRASS.

Also called Bahama grass in the West Indies. Now widely distributed in tropical and subtropical regions. A useful grass for sandy soils, but sometimes becoming a very bad weed in cultivated land.

Capsicum annuum. PIMIENTO.

Family Solanaceae; native of South America. The fruit furnishes the chilies of commerce. (Stahl, **6**: 123.)

Capsicum baccatum. AJÍ PICANTE.

Reported by Bello.

Capsicum frutescens. AJÍ.

Fruits used in the preparation of Cayenne pepper. (Stahl, **6**: 124.)

A specimen apparently belonging to this species was called "ají caballero" near Toa Alta.

Cara de caballo.

This name is applied to a variegated ornamental Caladium, probably *C. bicolor*.

Caracho. See *Lagenaria vulgaris*.

One of the names applied to the grooved gourd used as a musical instrument.

Caracolillo. See *Sabinea punicea*.

A wood stated by Captain Hansard to be common on hills. Not much used, but furnishes good firewood. Specific gravity, 1.20.

Caracolillo labrado.

Described by Grosourdy as a wild tree, 60 feet (18 meters) in height, with a trunk 3 feet (1 meter) in diameter. It furnishes a striped, yellow wood. In the form usually met with, the markings are in arches or spirals, from which fact the name is said to have arisen. The wood is very good for building purposes and is used quite extensively for shelves, etc.; its principal use, however, is in the manufacture of furniture. (Grosourdy, **2**: 371.)

Caracolillo liso.

A tree from the western part of the island; height 50 to 65 feet (15 to 20 meters); diameter 30 to 35 inches (75 to 90 centimeters). Wood yellow, hard; specific gravity, 0.943; used in making furniture. (Exp. 1857.)

Thought by Grosourdy to be a variety of caracolillo labrado, which it closely resembles in height and aspect, as well as in the color and uses of its wood. (Grosourdy, **2**: 371.)

Caracolillo listado.

A tree from the western part of the island; height, 15 to 20 feet (5 or 6 meters); diameter, 30 to 35 inches (75 to 90 centimeters). Wood yellow, streaked; specific gravity, 0.952; used in making furniture. (Exp. 1857.)

Cardenala azul. See *Lobelia cliffortiana.*

Cardiospermum halicacabum. Farolitos.

Family Sapindaceae; an annual, climbing herb, known as heart seed, winter cherry, and heart pea. At Rio Piedras a specimen (no. 1004) was obtained, under the name "bombija." (Stahl, 2: 153.)

Cardo. See *Carduus mexicanus.*

Cardosanto. See *Argemone mexicana.*

Carduus mexicanus. Cardo.

A native thistle, not abundant. (Urban, Symb. 1: 470, as *Cirsium mexicanum.*)

Cariaquillo. See *Lantana camara* and *L. crocea.*

Cariaquillo de Santa Maria. See *Lantana involucrata.*

Cariaquito blanco. See *Melanthera deltoidea.*

Carica papaya. See Papaw. Payaya.

Family in Porto Rico commonly called "lechosa," meaning "milky," or "papaya lechosa." This useful species is everywhere cultivated at low elevations; it has also escaped from cultivation and now grows spontaneously in waste places.

Caro. See *Vitis sicyoides.*

According to the list of the Exposition of 1857, there are two trees of this name, both occurring in all parts of the island. One has a height of 30 to 35 feet (9 to 11 meters); diameter 19 to 20 inches (48 to 50 centimeters). Wood light-colored, hard; specific gravity, 0.980; used in building houses. Also called "chupagallo." The other has a height of 35 to 40 feet (10 to 12 meters); diameter, 6 to 8 inches (15 to 20 centimeters). Wood yellow, hard; specific gravity, 0.873; used in making furniture. Also called "chino."

Caro agrio. See *Vitis acida.*

Caro de tres hojas. See *Vitis trifoliata.*

Carrasco. See *Comocladia.*

Carubio. See *Fagara monophylla.*

Caryocar nuciferum. Souari nut.

A tree belonging to the family Caryocaraceae. It is a native of Guiana, but has been cultivated in several of the West Indies. Three other species of Caryocar—*C. glabrum*, *C. barbinerve*, and *C. intermedium*—have been reported as growing in Martinique, but all are probably introduced.

Both the flowers and the fruit are very large, the latter several inches in diameter and inclosing from 2 to 4 hard-shelled nuts, the size of a hen's egg, but somewhat kidney-shaped, and with rounded warts on the outside. These are described as having a very pleasant flavor and also as yielding an oil to pressure. The tree attains a height of 100 feet (30 meters) or more, and the timber is of good quality, and very durable. Its chief use has been in the line of shipbuilding.

In his "Tropische Agrikultur" Semler expresses a very high opinion of the valuable qualities of the souari nut, considering it in fact the finest of all nuts, and the one most likely to prove successful and remunerative in culture. The taste is said to be similar to the almond, but sweeter, and the small quantities sent to the European markets have found ready sale at good prices. Successful attempts at culture have already been made on the island of St. Vincent, whence seed could probably be obtained.

Caryophyllus aromaticus. CLOVE.

The true clove, a native of the Malay region, has been introduced into several of the West India islands and in some cases has escaped from cultivation, but this is not known to have happened in Porto Rico. In the British island of Grenada quite extensive experiments have been made with the cultivation of the cloves, but the results have not been as favorable as with nutmegs, not because the trees do not thrive, but because the market is overstocked with the product of Zanzibar and the East Indies. Whenever the practice of intelligent mixed farming shall have been introduced into Porto Rico, the clove may serve as a minor resource. For culture on a large scale it does not appear for the present to be especially promising, in view of the results of the Grenada experiment.

Carusillo.

A native grass valued for pasturage in the region of Yauco, and considered sweeter and more nutritious than either Guinea or Para grass.

Cascabelillo alado. See *Crotalaria stipularis.*

Cascabelillo axilar. See *Crotalaria lotifolia.*

Cascabelillo grande. See *Crotalaria retusa.*

Cascabelillo vacío. See *Crotalaria incana.*

Casearia bicolor. TALANTRON.

Also called "cotorrerillo." A tree of 15 meters, belonging to the family Flacourtiaceae. Known only from the vicinity of Utuado.

Casearia hirta.

A shrub or tree, from river banks near Sabana Grande.

Casearia nitida. CAFETILLO.

A shrub 6 to 15 feet (2 to 5 meters) high. (Stahl, 4: 33.)

Casearia parvifolia. GIA MANSA.

A shrub about 15 feet high. From Peñuelas and Utuado in mountains and waste places. (Stahl, 4: 31.)

Casearia ramiflora. CAMBRON.

A shrub or tree 6 to 20 feet high. From Utuado and Manati, in thickets. Bello reports the common name for *C. spinosa.* (Stahl, 4: 30.)

Casearia samyda. COTORERRILLO.

Reported by Bello from Utuado.

Casearia spinosa. See *Casearia ramiflora.*

Casearia stipularis. GIA VERDE.

A shrub or small treee of from 3 to 4 meters; also called "rabojunco." (Stahl, 4: 27.)

Casearia sylvestris. SARNA DE PERRO.

A shrub or tree attaining 35 feet (11 meters), common in mountain woods and waste places. (Stahl, 4: 26.)

Cashaw. See *Anacardium occidentale.*

The more usual and preferable form is cashew. In Jamaica the name "cashaw" is said to be applied to *Prosopis juliflora.*

Cashew. See *Anacardium occidentale.*

Cassada. See *Manihot.*

Cassareep. See *Manihot utilissima.*

Cassava. See *Manihot.*

Cassia alata. See *Herpetica alata*

Cassia bacillaris. Sen de palillos.

A trailing herb growing in waste places both in the lowlands and in the mountains. (Stahl, 3: 110.)

Cassia bicapsularis. Sen del pais.

Probably an introduced species; known in Porto Rico only from the vicinity of Fajardo, but distributed elsewhere in tropical America and in Madeira. (Stahl, 3: 109.)

Cassia biflora. Retama.

A fine-leaved species with numerous yellow flowers; reported by Bello from the vicinity of Cabo Rojo. (Stahl, 3: 114.)

Cassia diphylla. See *Chamaecrista diphylla.*

Cassia eglandulosa. See *Cassia emarginata.*

Cassia emarginata.

With rather long, straight, somewhat turgid pods. (Stahl, 3: 114.)

Cassia fistula. Cañafistulo.

A tree sparingly introduced in Porto Rico. It is said to be a native of upper Egypt and is valued for the sake of the purgative pulp in which the seeds are embedded. The cylindrical pods are 15 to 20 inches long. (Stahl, 3: 105.)

In some countries the bark is said to be used for tanning.

This tree must have been very early introduced into the West Indies, as Acosta states that the fleet in which he returned to Spain in 1587 carried 45 hundredweight of the fruit for medicinal purposes.

A low tree common in all the Antilles and on the American continent; about 20 feet high with a trunk 9 or 10 inches in diameter. Furnishes a strong wood, reddish in color, of ordinary weight and hardness, but without use. (Grosourdy, 2: 369.)

Cassia grandis. Cañafistula cimarrona.

A tree attaining the height of 10 meters, said by Stahl to be found in Porto Rico in the wild state, though rarely; it is also native on the Isthmus of Panama and other parts of tropical America. The pulp of the pods is said to be used as a substitute for that of *Cassia fistula.* The flowers are rose-colored and appear in April in large lateral racemes. (Stahl, 3: 106.)

A fine tree 45 to 54 feet (14 to 17 meters) high with a dense top and trunk 12 to 18 feet (4 to 6 meters) long and 12 to 15 inches (30 to 37 centimeters) in diameter. Furnishes a very handsome wood, very strong and very resistant, of ordinary weight and hardness, fibrous in texture and fine-grained; specific gravity 0.816. Although not at present utilized, Grosourdy considers this wood very suitable for carpenter work and perhaps for cabinetwork. (Grosourdy, 2: 370.)

Cassia glandulosa. See *Chamaecrista glandulosa.*

Cassia laevigata. Sen del pais.

Shrubby; leaves very similar to those of *C. occidentalis.* Reported from Adjuntas. (Stahl, 3: 108.)

Cassia obtusifolia. See *Cassia tora.*

Cassia occidentalis. Hedionda.

This is the common tropical weed which has been variously reported from the West Indies and from Florida as a coffee substitute. Even in Porto Rico this idea has long been prevalent, and the seeds are regularly on sale in the markets, and small quantities have been exported. The usual price is 12 centeros (7.2 cents) per pound. Analysis has failed to find caffein or any similar alkaloid, and the "coffee" must be ranked with that made from burnt peas and the like. Tonic and febrifugal properties have been ascribed to this drink, and it has also been used as a coffee adulterant. An attempt was made to introduce it into Europe from Africa as "fedegosa," "negro coffee," or "cafe de Soudan." (Stahl, 3: 111.)

Cassia polyphylla.

Known from Salinas de Cabo Rojo and Coamo.

Cassia tora.

A weedy rank herb with long falcate linear pods. (Stahl, 3: 115.)

Cassipourea elliptica. PALO DE OREJA.

Family Rhizophoraceae. A tree or shrub 3 to 9 meters high. (Stahl, 4: 142.)

Castalia. WATER LILY. FLOR DE AGUA.

Stahl describes under the synonym Nymphaea three indigenous species, *N. ampla*, *N. minor*, and *N. rudgeana*. Bello gives the name "yerba de hicotea" for *N. ampla*, with the explanation that tortoises (*tortugas*) are in Porto Pico called "hicotea."

Castaño.

In Spain the name of the chestnut, *Castanea sativa*, but in Porto Rico and Cuba applied to the breadfuit tree, doubtless on account of the fact that the seeds somewhat resemble chestnuts in size, shape, and color.

Castor bean. See *Ricinus.*

Casuarina.

The Casuarinas about San Juan are few and spindling, and do not make the vigorous growth apparent in the streets of Key West, but on the drier south side of the island they seem to flourish much better, and some are supposed to have been introduced from that island, although in reality natives of Australia.

Catalpa longisiliqua. ROBLE.

A wild tree rather abundant in the Antilles and on the Continent, 40 to 50 feet (12 to 15 meters) high, with a trunk 15 to 30 inches (37 to 75 centimeters) in diameter. It furnishes a wood very hard, very strong, and very good for rough carpenter work, carts, etc. (Grosourdy, 2: 382; also 411.)

Catesbaea melanocarpa.

Family Rubiaceae; a species recently described from Porto Rico, St. Croix, and Antigua, formerly confused with *C. parviflora*. A shrub from the south side of the island. (Urban, Symb. 1: 427.)

Catesbaea parviflora.

A spiny shrub 6 feet (2 meters) high, known from Guanica (summit of mountain called "El Maniel"), and from near Guayanilla. (Urban, Symb. 1: 428.)

Catire.

A vine sold in the market of Ponce as an ingredient of a refreshing drink.

Cat-tail. See *Typha domingensis.*

Cautiva.

A bignoniaceous tree was called by this name at Santurce, but our specimen (no. 81) has not yet been identified.

Cayaponia americana.

Family Cucurbitaceae. A variety *subintegrifolia* has been described from near Maunabo. (Stahl, 4: 172.)

Cayaponia racemosa. COLOQUINTILLA.

An annual vine growing in waste places. Cogniaux has named a variety *plumieri*. (Stahl, 4: 170, as *Cionandra racemosa.*)

Cayenne pepper. See *Capsicum.*

Cayur. See *Anona palustris.*

Ceanothus reclinatus. See *Colubrina reclinata.*

Cebada. See *Hordeum.*

Cebolla. See *Allium cepa.*

Ceboruquillo. See *Thouinia tomentosa.*

A tree from the western part of the island; height 70 to 80 feet (21 to 24 meters); diameter 10 to 12 inches (25 to 28 centimeters). Wood, light-colored, hard; specific gravity, 0.857; used for packing boxes. (Exp. 1857.)

Cecropia obtusa.

Collected by Sintenis near Bayamon.

Cecropia peltata. TRUMPET TREE. YAGRUMO HEMBRA.

The name "yagrumo hembra" has reference to the fact that this tree is popularly supposed to be the female of *Didymopanax morototoni*, called "yagrumo macho." The stems of the present species are hollow; it grows very rapidly and although attaining a height of 50 feet (15 meters) with a diameter of a foot (25 millimeters) or more, it seems rather like an overgrown herb than a real tree. The trunk and branches are partitioned at the nodes or former points of attachment of the very large peltately divided leaves.

The juice of Cecropia contains india rubber, but the quantity obtainable by the usual process of tapping is small and the product has not become of commercial importance.

Cedar. See *Cedrela odorata.*

Cedrela odorata. WEST INDIAN CEDAR. CEDRO.

Family Meliaceae. A large tree; wood of a brown color and fragrant odor, known variously as West Indian, Spanish, Jamaica, or Honduras cedar; used for furniture, moth-proof chests, shingles, canoes, and other articles that have to withstand the weather; also for cigar boxes. (Stahl, **2**: 168.)

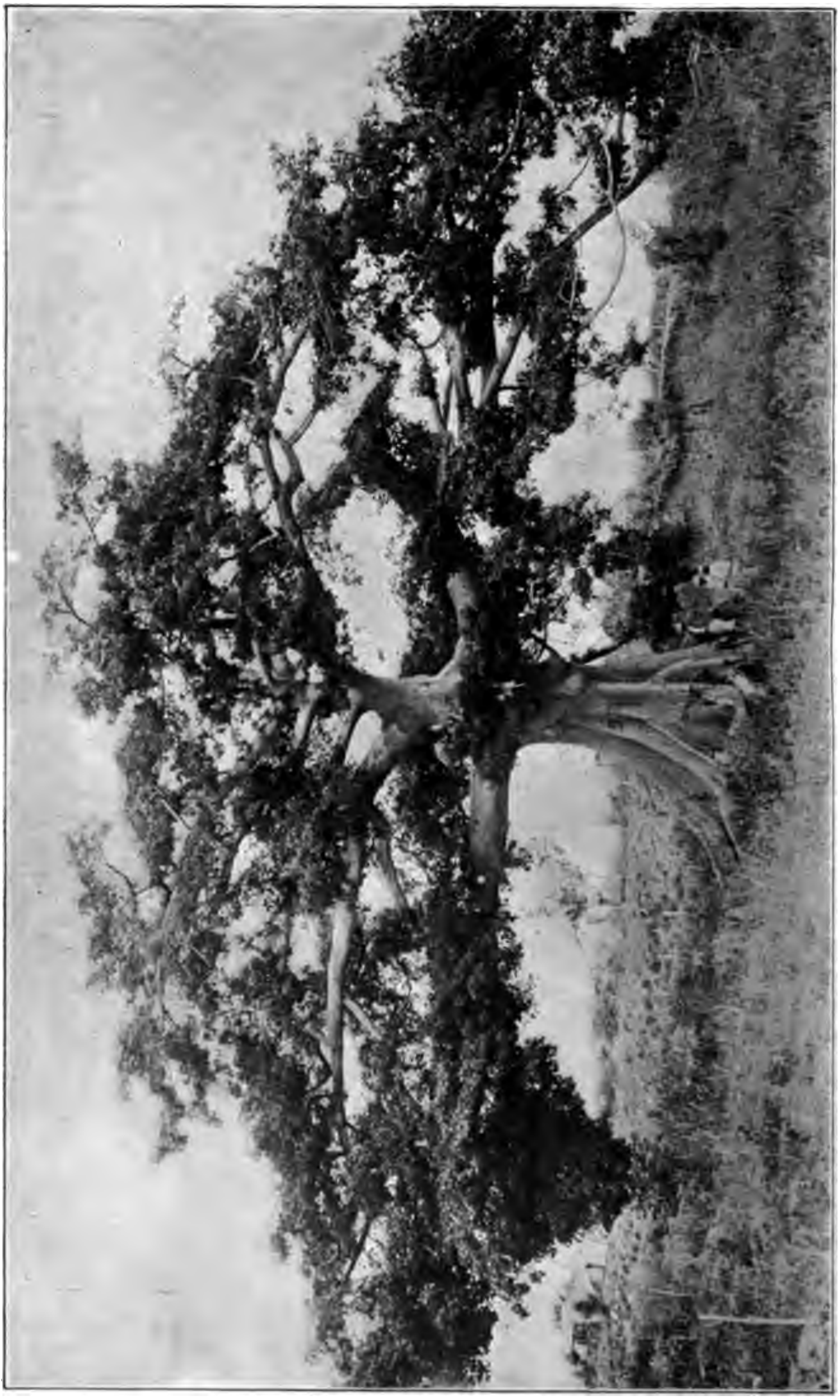
Color, pale reddish brown. Large ducts few, occurring singly, irregularly grouped, and scattered. Medullary rays few and indistinct. Wood fibers interlaced, the wood splitting irregularly. Very similar to the mahogany of commerce. Probably *Cedrela odorata*, the well-known cigar-box wood of commerce. It is no longer abundant in Porto Rico, and is now largely imported from Santo Domingo, costing $150 per 1,000 feet. It still grows in Aguadilla and near Aibonito, Juana Diaz, Cayey, and Luquillo. (Hill and Sudworth.)

Grosourdy distinguishes three varieties of the wood—cedro blanco, cedro hembra colorado, and cedro macho—but states that the trees are identical.

The tree is 60, 90, or 100 feet (18, 27, or 30 meters) high, with a long straight trunk 4½ to 6 feet (1.5 to 2 meters) or more in diameter. Planted this tree would be a source of wealth, and already plantations exist in Cuba, an example that should be followed in the other Antilles, for it not only grows with greater rapidity than mahogany, but is also much less delicate and will prosper in all localities. The tree, however, prefers a clean light soil on the tops of hills or on plains. It is not injured by moisture, except when the soil is submerged. It is propagated by seeds or cuttings, and reaches its growth in forty years.

This precious wood of agreeable odor is very lasting. It is heavier, more compact, and darker colored than mahogany, which the variety called "cedro macho" much resembles; the variety known as "cedro hembra" is much lighter, less compact, softer, and much lighter in color. The first-named variety is used for furniture, carpenter work, and the interior of houses, and for the latter is preferred to mahogany, being softer and more easy to work, also having the advantage of never being attacked by insects. It is also used for windows, balconies, etc. The military authorities use it for boxes, powder vessels, etc.

The second variety is fit for the same purposes, and is furthermore used extensively in making cigar boxes. The specific gravity is 0.474 and 0.461. (Grosourdy, **2**: 374.)



CEIBA TREE (CEIBA PENTANDRA). NEAR PONCE.

Cedro blanco. See *Cedrela odorata.*

Cedro hembra. See *Cedrela odorata.*

Cedro hembra colorado. See *Cedrela odorata.*

Cedro macho.

A tree from all parts of the island; height, 50 feet (15 meters); diameter, 55 to 60 inches (133 to 150 centimeters). Wood, blackish, hard; specific gravity, 0.878; used in building houses. (Exp. 1857.)

Ceiba pentandra. SILK COTTON. CEIBA. PLATE XXIV.

Family, Bombacaceae; a high tree, 20 to 30 meters, with spreading, horizontal branches. The cotton covering the seeds is used in making beds and pillows. The wood is white and soft, but in Porto Rico is considered desirable for minor building purposes, such as inside partitions. The leaves are palmately divided, like those of the horse-chestnut, and the tree is sometimes called the "five-leaved silk cotton," to distinguish it from Ochroma and others which produce a silky fiber. The name "Bombay ceiba" is also used, perhaps as a corruption of Bombax, formerly the generic name.

The ceïba tree is much more common on the south side of the island, but nearly all have had the larger branches twisted off by the hurricane, the wood being soft and brittle. The trunks of young trees of this species are beset with large, conical spines, but in age these fall away and are to be found only on the branches. The trunk is further transformed by the growth of prominent wings or buttresses, sometimes 2 feet (0.6 meter) wide, while but a few inches thick. In west Africa, where this tree is larger and more luxuriant, pieces of these supporting wings are sawed out and used as doors of native houses.

A specimen near Ponce measured 36 meters in circumference at 4 feet from the ground, by following the sinuosities of the trunk.

Grosourdy (2:375) says of the wood:

"It is white, soft, very light, but rather strong and resists water moderately well, for which reason it is used to make canoes, although for this purpose it is not as durable as is generally supposed. The bottoms of such boats are sometimes coated with the fat from turtles to render them more durable, but when so treated the bottom is likely to crumble suddenly. The wood is also used to make tubs and basins. Specific gravity, 0.520."

The fiber surrounding the seeds of this and related species is the "kapok" of commerce, and is exported in considerable quantities from the west coast of Africa.

Ceibilla.

A tree from all parts of the island; height, 40 to 45 feet (13 to 14 meters); diameter, 40 to 45 inches (100 to 115 centimeters). Wood, white, soft; specific gravity, 0.642; not used. (Exp. 1857.)

Cenizo. See *Chenopodium album*, *Fagara martinicensis*, and *Tetrazygia elaeagnoides.*

A tree from all parts of the island; height, 90 to 100 feet (27 to 30 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood, yellowish, soft; specific gravity, 0.741; not used. (Exp. 1857.)

According to Captain Hansard the specific gravity is 0.74 and the wood was formerly used for hogsheads.

Under this name Grosourdy refers to a number of species of Zanthoxylum and describes it as a large, dense tree, one kind, "massa de hercules," reaching 15 to 20 meters in height, with a straight, rather long, spiny trunk from 24 to 30 inches (60 to 75 centimeters) in diameter. The wood is light-colored and very handsome. It is fibrous in texture, rather hard, light, and strong. Used in the construction of country houses. Specific gravity, 0.380. The bark in some species is spineless. (Grosourdy, **2**: 363.)

Centella asiatica. YERBA DE CLAVO.

An herbaceous annual, growing in moist places. (Stahl, **4**: 194.)

Cephaelis triplocephala. TRESCAPEZAS.

Family Rubiaceae; an herb. (Stahl, **5**: 80.)

Cera. See *Sapium sebiferum.*

Cerasus occidentalis. See *Prunus occidentalis.*

Cereipa.

Under this name flat, oily seeds with a reticulated shell, said to be useful in the form of a liniment made with rum, and a bark used as an ingredient of a refreshing drink, were sold in the market of Ponce.

Cerero. See *Myrica cerifera.*

Cereus. PLATE XXV.

A large genus belonging to the family Cactaceae.

Numerous species occur in Porto Rico, particularly about Coamo and in the vicinity of Guayanilla. One species collected near Guayama bore large edible fruits with a delicate and very refreshing flavor. This species might well deserve cultivation.

Cereus grandiflorus. REINA DE LAS FLORES.

Family Cactaceae; a fleshy plant, with large, fragrant, white flowers, found in all the Antilles. (Stahl, **4**: 188.)

Cereus quadricostatus.

From vicinity of Guayanilla.

Cereus swartzii. SEBUCAN.

A fleshy plant, 3 meters high, found on the southern coast of the island. (Stahl, **4**: 187.)

Cereus triangularis. PITAJAYA.

A fleshy plant, 1 to 3 meters high, found on rocks and decayed trees. (Stahl, **4**: 187.)

Cerezas. See *Cordia collococca, C. nitida,* and *Malpighia coccigera.*

Cerezas blancas. See *Cordia alba.*

Cerezas cimarronas. See *Cordia elliptica.*

Cerezo.

"Cherry tree;" according to Captain Hansard the specific gravity is 0.61.

Cerezo commun, cerezo de la tierra. See *Cicca disticha.*

Cerillo.

A specimen (no. 22) not yet identified was obtained at Lecheria under this name, not previously recorded for a Porto Rican plant. In Cuba the name is said to be used for *Exostemma caribaeum,* a rubiaceous tree, also called "managua de costa," for which "cuero de sapo" is given by Stahl. "Cerillo de costa" and "cerillo de loma" are also in use in Cuba for other plants.

Cestrum laurifolium. GALAN DEL MONTE.

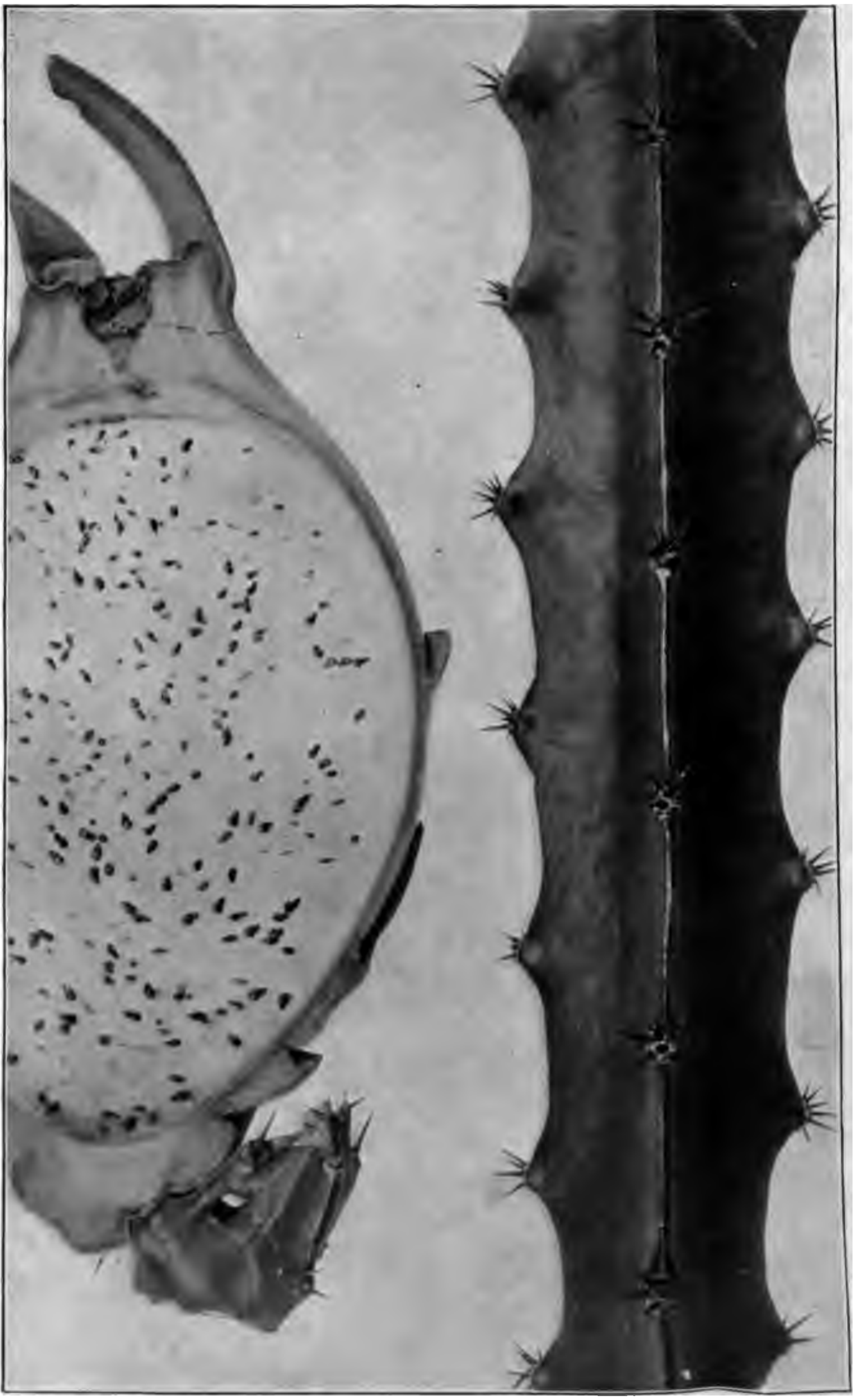
Family Solanaceae; a shrub 3 to 4 meters high, found in waste places. (Stahl, **4**: 141.)

Cestrum nocturnum. DAMA DE NOCHE.

Family Solanaceae; an ornamental shrub cultivated in gardens. It has white flowers, very fragrant at night. (Stahl, **4**: 140.)

Chamaecrista diphylla. SEN DE DOS HOJAS.

A low shrubby herb differing from the other species of this genus and Cassia in having two obovate leaflets and very large stipules. (Stahl, **3**: 116, as *Cassia diphylla.*)



STEM AND EDIBLE FRUIT OF CEREUS SP. AT GUAYAMA.

Chamaecrista glandulosa. TAMARINDILLO.

A rather small species, with large flowers similar to *C. fasciculata*, of the eastern United States. The leaves are much like those of the tamarind, whence the common name. (Stahl, 3: 117, as *Cassia glandulosa.*)

Chamaecrista portoricensis. RETAMA.

The variety *callosa* is said to be called "retama," and the variety *granulata* "escobilla," but it is not probable that any such precision actually exists. The plant is a small shrub from the limestone hills about Guayanilla, Guanica, and Cabo Rojo. (Urban, Symb. 1: 317, under Cassia.)

Chamico blanco. See *Datura metel.*

Chamico morado. See *Datura stramonium.*

Chamisco. See *Datura stramonium.*

Chamiso. See *Dodonaea viscosa.*

Chaptalia nutans. BRETONICA.

An annual composite pubescent herb growing in ravines and steep places, preferably moist and sandy. (Stahl, 5: 152, as *Leria nutans.*)

Chayote. See *Sechium edule.*

Chenopodium album. PIGWEED. CENIZO.

Family Chenopodiaceae; the familiar pigweed of our gardens.

Chenopodium ambrosioides. BASOTE.

Collected at Cataño. (No. 991.)

Cherimolia. See *Anona squamosa.*

Cherimoyer. See *Anona squamosa.*

Cherry.

The genuine cherry does not thrive in the Tropics, but in Porto Rico the Spanish name for cherries, "cerezas," is applied to the fruits of species of Cordia and Malpighia.

Cherry, Jamaica. See *Ficus pedunculata.*

Chiagari. See *Cuphea micrantha.*

Chicarron. See *Comocladia.*

Chicharo.

A name applied to a considerable variety of smaller leguminous vines.

Chicharron. See *Reynosia uncinata.*

Chicoria. See *Sonchus arvensis* and *S. oleraceus.*

Chicoria azul. See *Lactuca intybacea.*

Chicoria cimarrona. See *Lobelia assurgens.*

China. See *Citrus aurantium.*

China dulce. See *Citrus aurantium.*

Chino.

A tree from all parts of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 6 to 8 inches (15 to 20 centimeters). Wood yellow, hard; specific gravity, 0.873; used in making furniture. Also called "caro," and presumably not the orange tree. (Exp. 1857.)

Chiococca racemosa. BEJUCO DE BERAC.

Family Rubiaceae; a shrub 2 to 3 meters high, biennial; found in waste places and at bases of mountains. (Stahl, 5: 62.)

Chione glabra. MARTIN AVILA.

Family Rubiaceae; a tree 10 meters high; used for lumber. (Stahl, 5: 57.)

Chirimoya. See *Anona squamosa.*

Chirivita. See *Erigeron spathulatus.*

Chlorophora tinctoria. Fustic.

Family Moraceae; a tree reported from Guanica. A variety *xanthoxylon* is also known from Bayamon. The yellow wood furnishes a yellow dye; also used for brown and green shades. Fustic to the value of $121,665 was imported in 1899, according to the Treasury reports.

A tree of slow growth that reaches a height of 50 feet (15 meters), and with a trunk 1½ to 2 feet (0.5 to 0.6 meter) in diameter. Furnishes an elegant wood of a handsome yellow or orange color, with time and exposure to the air turning slowly lighter until it becomes a dirty yellow, which is improved by varnishing when used for furniture. Specific gravity, 0.711. In the countries where it grows the wood is used for shelving in the country houses, for the spokes of carriage and wagon wheels, and wherever strength and resistance are necessary. (Grosourdy, **2** : 383.)

The native name "mora" is given by this author.

Chocho. See *Sechium edule.*

Chocolate. See *Theobroma cacao.*

Chrysobalanus icaco. Icaco. Plate XXVI.

Family Rosaceae; shrub 2 meters high, found on dry beaches; known as "cocoa-plum." Fruits about the size of a plum, used for preserves. The variety *pellocarpus* is reported from Manati. Bello spells the common name "hicaco." (Stahl, **4**: 64.)

Chrysophyllum cainito. Star apple. Cainito.

Family Sapotaceae: a tree 10 to 15 meters high, with fruit about the size of an apple; edible, and said to be very constipating when eaten with orange; Bello and others sometimes write the common name "caimito." (Stahl, **6**: 45.)

Very similar to the species referred to under "caimitillo," which should probably be referred to this species. The wood is darker, violet-colored, and rather coarse. Not used, but thought by Grosourdy to be suitable to the same purposes as caimitillo. Specific gravity, 0.889. (Grosourdy, **2**: 369.)

Chrysophyllum glabrum. Lechecillo.

A tree or shrub 4 to 5 meters high. (Stahl, **6**: 48.)

Chrysophyllum krugii.

A recently described species collected by Sintenis between Coamo and Aibonito.

Chrysophyllum monopyrenum. Caimitillo.

A tree 3 to 5 meters high, bearing an edible fruit called in Jamaica "damson plum." Bello reports the common name "teta de burro" for *C. olivaeforme.* (Stahl, **6**: 46.)

Furnishes a very strong and solid flesh-colored wood that is not used except to make charcoal for forges, for which it is highly valued. (Grosourdy, **2**: 415.)

Chrysophyllum oliviforme. See *Chrysophyllum monopyrenum.*

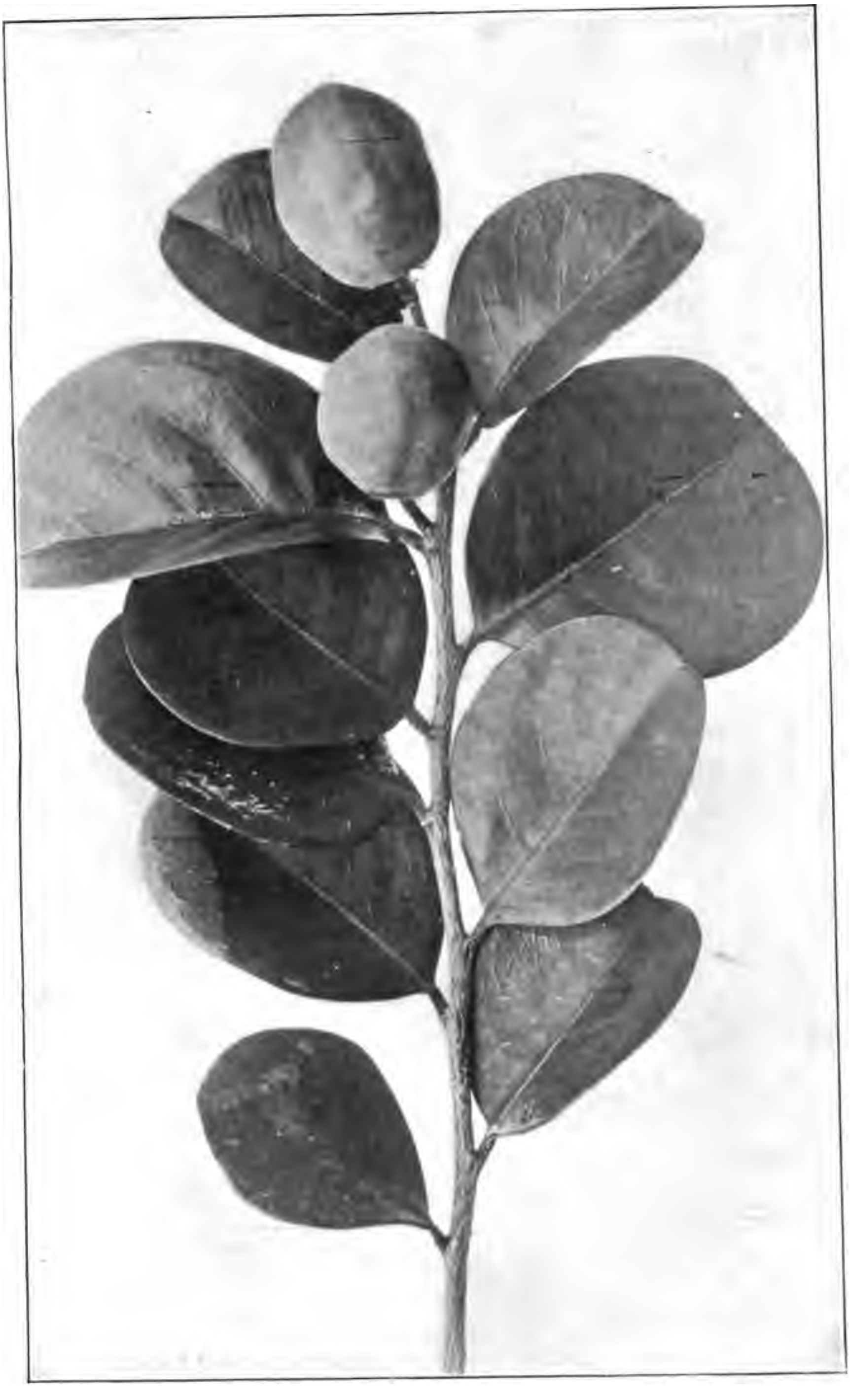
Chupa gallo. See *Cinnamodendron macranthum.*

Chupagallo.

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 19 to 20 inches (47 to 50 centimeters). Wood light-colored, hard; specific gravity, 0.980; used in building houses. Also known as "caro." (Exp. 1857.)

Cicca disticha. Cerezo comun.

A tree 21 to 24 feet in height, with a trunk 6 to 8 inches (15 to 20 centimeters) in diameter. Furnishes, after polishing, a very pretty wood, having as yet no application. The wood is of ordinary weight, fibrous in texture, rather hard, fine-



ICACO (CHRYSOBALANUS ICACO).

grained, but not very lasting. Specific gravity, 0.577. Also called "cerezo de la tierra." (Grosourdy, 2: 376.)

Cicca disticha is given as a synonym of *Phyllanthus distichus*, an Indian species.

Cicer arietinum. GARBANZO.

The extensive use of garbanzos or chick-peas by the Porto Ricans, and doubtless also by other Spanish-Americans, suggests the desirability of cultivating them in the United States for export to these tropical countries. Moreover, they are undoubtedly a palatable and nutritious dish which, if properly introduced, should find a place on the American table.

We could not learn that any "garbanzos" were grown in the island or that any experiments in this direction were ever tried.

Cidron. See *Lippia nodiflora.*

Cieneguillo. See *Daphnopsis philippiana*, *Eugenia confusa*, *Comidesia lindeniana* and *Myrcia deflexa.*

Cienigilla.

A tree with very hard white wood; grows to no great size; similar to ash; not uncommon in the mountains. (Hansard.)

Cieniguillo. See *Myrcia ferruginea* and *M. deflexa*

Doubtless the same name as cieneguillo.

Cinchona. QUININE.

Experiments have been tried with cinchona in Jamaica, but the market is now well supplied by Java and the British West Indies, so that planting in Porto Rico does not seem advisable from the commercial standpoint.

Cinnamodendron macranthum. CHUPAGALLO.

A tree belonging to the family Canellaceae; 10 meters high, with greenish white, orange-perfumed flowers. From Sierra de Luquillo. (Urban, Add. 1: 9.)

Cinnamomum camphora. CAMPHOR TREE.

The true camphor tree of Japan and China has been successfully planted in California and in the warmer parts of our Gulf States, since it is able to withstand light frosts. It makes a beautiful and in every way desirable shade tree in addition to its value for the extraction of camphor, for which some have calculated that its culture would be a paying business. It seems entirely probable that the camphor tree would grow well in Porto Rico, and the conditions are probably favorable for the production of the gum, in which respect the culture of camphor in North Africa has failed, perhaps owing to the too great heat and dryness of the climate.

The present species is not the only one yielding camphor; *Blumea balsamifera*, a composite herb native in China, and *Dryobalanops aromatica*, a large tree of the family Dipterocarpaceae, native in Borneo and neighboring islands, also yield substances closely similar to camphor, and even more highly valued.

Cinnamomum zeylanicum. CINNAMON.

The cinnamon tree is native in Ceylon and other parts of the East Indies, and has been introduced into the American tropics, though not known to have reached Porto Rico. It might thrive in a few situations on the south side of the island, but a dry, sandy soil is considered necessary for the production of bark of good quality, and Porto Rico has little land of that kind. *Cinnamomum cassia* and other species of the genus are more hardy and produce commercial barks used as substitutes and adulterants of the true cinnamon, to which they are inferior.

Cinnamon. See *Cinnamomum.*

Cinnamon, wild. See *Canella alba* and *Amomis caryophyllata.*

Cionandra racemosa. See *Cayaponia racemosa.*

Cipil.

A tree from the interior of the island; height 45 to 50 feet (13 to 15 meters); diameter 12 to 15 inches (30 to 37 centimeters). Wood white, very hard; specific gravity, 0.960; used in boat building. Also called "pino." (Exp. 1857.)

Ciralillo. See *Meliosma obtusifolia.*

Cirila. See *Cyrilla antillana.*

Ciruela del pais. See *Spondias purpurea.*

Cissampelos microcarpa. Bejuco de mona.

Reported by Bello from the western part of the island.

Cissampelos pareira. Bejuco de mona.

Family Menispermaceae; an annual herb. The "pareira brava" of the pharmacopoeia is a product of this plant; said to be an antidote for poison, and valuable in medicine. (Stahl, **2**: 31.)

Cissus acida. See *Vitis acida.*

Cissus sicyoides. See *Vitis sicyoides.*

Cissus trifoliata. See *Vitis trifoliata.*

Citharexylum quadrangulare. Péndulo colorado. Plate XXVII.

Family Verbenaceae; a tree 20 to 60 feet (6 to 18 meters) high, with red wood; useful for furniture and building. Found in mountain districts. Sintenis' specimen from Cayey (no. 2321) has the leaves broader and more nearly elliptical and may be distinct from his 3723. Bello gives the common names "pendola" and "palo de guitarra." (Stahl, **6**: 211.)

Grosourdy (**2**: 409), under the native name "péndula," describes this species as a wild tree reaching 50 feet (15 meters) in height, with a moderately straight trunk 18 inches (45 centimeters) in diameter. Furnishes a rather strong, straw-colored wood that breaks with an oblique fracture. It is used for beams, windows, doors, etc. The natives make their guitars of this wood. Specific gravity, 0.753 and 0.722.

Citron. See *Citrus medica.*

Citrullus vulgaris. Watermelon. Sandía. Patilla.

Watermelons seldom reach marketable quality in humid tropical countries. A few were seen in the market of San Juan, but none of them would have been considered fit to eat in the United States. Watermelon growing is scarcely to be recommended as a profitable business in Porto Rico, though with properly selected conditions and careful cultivation fairly good fruit can probably be raised, as reported by one of the Department's correspondents. Muskmelons will probably succeed somewhat better.

Citrus.

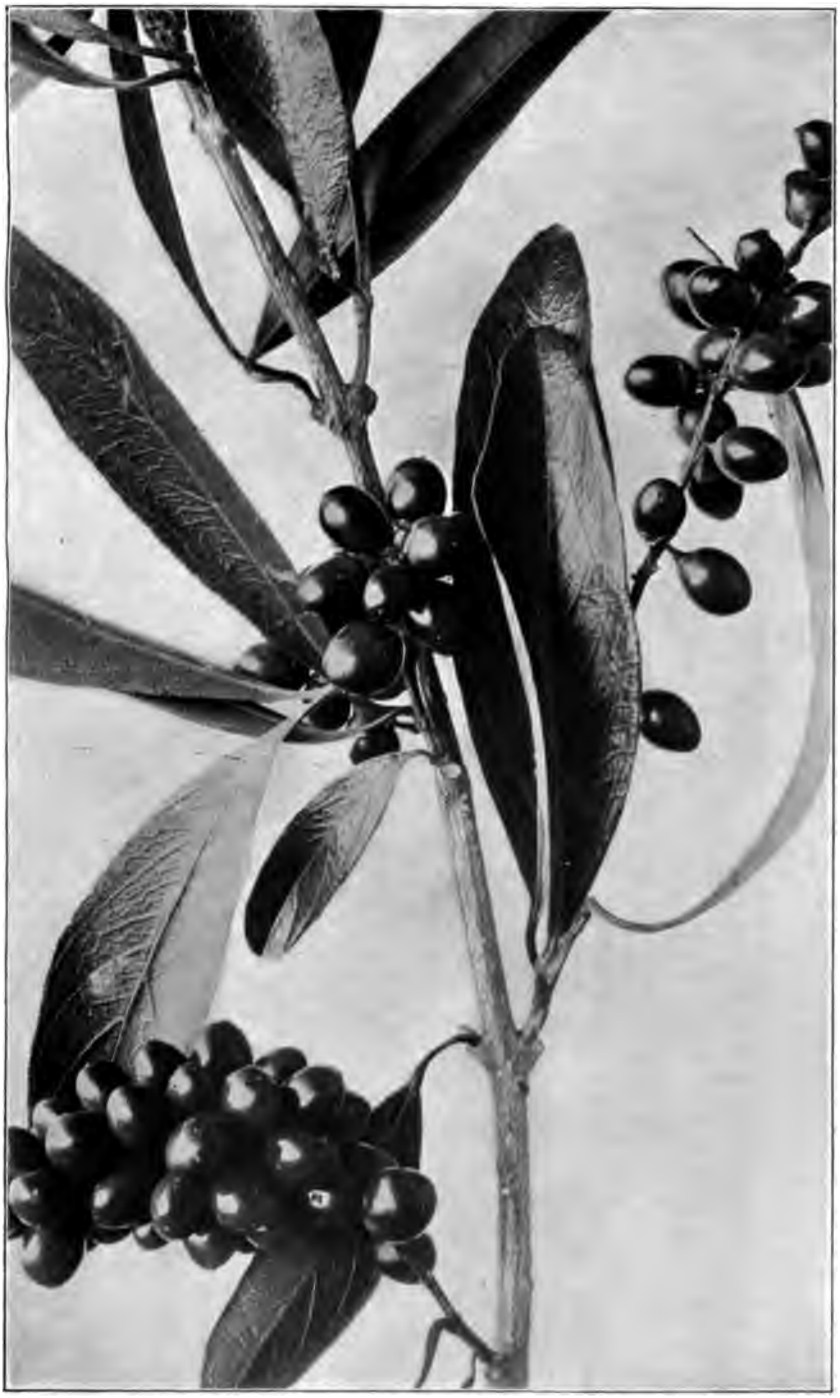
Grosourdy (**2**: 394) says of the lemon and orange that they furnish a wood very strong, flexible, compact, and of good durability and resistance. It is, however, more an object of curiosity than utility, although it is used for moldings and inlaid work of fine furniture. The military authorities of San Juan use it for the handles of tools. He gives the specific gravity of lemon as 0.833 and that of the orange as 0.815.

Citrus aurantium. Sweet orange. China.

"China" is the name under which the common sweet orange is known in Porto Rico, the Spanish name for the orange, "naranja," being applied to the sour orange.

This fruit may be distinguished from the sour orange not only by the taste but by the smoother and more even surface, the thinner and more closely fitting rind, and the solid center.

Until recently the orange in Porto Rico has been propagated only by seeds, and



PÉNDULO COLORADO (CITHAREXYLUM QUADRANGULARE). ROAD BETWEEN PONCE AND ADJUNTAS.

as might be expected under such circumstances the fruit is anything but uniform in character. The majority of those offered in the markets are of such low grade that they would hardly have been placed before a public accustomed to a fruit of good quality. As a rule, the fruits are very juicy but lack texture and flavor. Specimens of a high-grade orange were, however, secured at San Juan, and fruit specialists at Washington were of the opinion that this variety might even profitably be used for propagation by budding.

According to Captain Hansard, a weed called "cojitre" placed around the orange tree sweetens the fruit. This is believed to be a leguminous plant and suggests the possibility of its use as a substitute for the nitrogenous manure which is said to be necessary for the best results with this fruit.

Ten years are thought to be necessary for a tree to reach full bearing. It is claimed that a single tree will sometimes produce several thousand oranges.

"Naranja china" and "china dulce" are names sometimes applied to the sweet orange.

Citrus bigaradia. SOUR ORANGE. NARANJA.

The most common of the citrous fruits is perhaps the sour orange, or "naranja," as it is universally called in Porto Rico. The ordinary Porto Rican sour orange is believed to belong to this species, and is not the Seville orange, as has been reported.

In Florida the sour orange is used for stocks in all plantings on moist land, for the reason that it resists the foot rot, or *mal di goma*, and other diseases which affect other varieties when planted on heavy soils.

Citrus decumana. POMELO. TORONJA.

Pomelo seems now to be the name preferred for the fruit otherwise known as grape fruit. The shaddock is thought to be a slightly different horticultural variety.

Pomeloes were seen growing near Bayamon, but as the fruit was immature the quality could not be judged. Although not so sensitive to frosts as the lime or lemon, the pomelo requires tropical conditions for properly maturing the fruit, and the increasing popularity of this fruit will warrant careful experiments in Porto Rico.

Citrus hystrix acida. LIME. LIMA.

The lime is referred by different authors to both *C. medica* and *C. limetta*, as well as to the present species.

The limes of Porto Rico seem to be quite normal and of good quality.

The lime endures shipment well if properly packed, and as the quality of the Porto Rican fruit is good it is perhaps the most eligible fruit with which to open a trade.

In the British island of Montserrat the production of limes for the extraction of lime juice has been made quite an industry. About 1,400 acres are planted to limes, over 1,200 belonging to a single estate. The annual total of income from the industry averages over $30,000, and other islands contribute large quantities.

Citrus limonum. LEMON. LIMON.

The Porto Rican lemon seems to be somewhat intermediate between the genuine lemon and the rough lemon of Florida and Jamaica.

Commercially it can not be expected to compete in the market with the ordinary lemon, but for eating and possibly for the preparation of unsweetened lemonade, it might become popular with those who are partial to acid fruits.

Citrus medica. CITRON. TORONJA.

To this species are referred by some authors not only the citron, but the lemon, lime, bergamot orange, and the sweet lemon, or "lemon dulce."

A specimen of citron was secured from a street vender in San Juan. He stated that considerable quantities are grown in the vicinity of Trujillo Alto, but there was no opportunity of investigating that locality. Large amounts of citron peel are imported into the United States from Mediterranean countries, notably from Corsica, and experiments in the culture of the trees are being made in Florida and California. The possibility of success in Porto Rico is worthy of investigation. Although none of the citrons now in commerce are grown in tropical countries, there are said to be varieties of excellent quality in Hindostan and the Malay Peninsula. The Porto Rican specimen observed was of medium size, but the skin was too thin and too loose in texture and apparently deficient in flavor. Some or all of these defects may, of course, be due to the absence of proper culture.

Citrus vulgaris. See *Citrus aurantium.*

Clavel. See *Cosmos caudatus.*

Clavelillo. See *Stemmodontia carnosa.*

At Toa Alto and Cataño this name was also used for a species of Spermacoce not yet identified.

Clavellina. See *Poinciana pulcherrima.*

Clavelon de playa. See *Borrichia arborescens.*

Clematis dioica. CABELLOS DE ANGEL.

Family Ranunculaceae; a shrubby climber, found in mountains, flowering in December. Called "virgin's bower," "rudding withe," and "traveler's joy" in Jamaica. From vicinity of Lares. (Stahl, **2**: 19.)

Cleome pentaphylla. See *Gynandropsis pentaphylla.*

Cleome pungens. See *Cleome spinosa.*

Cleome speciosa. See *Gynandropsis speciosa.*

Cleome spinosa. VOLATINES PUNZANTES. SAMBO.

Family Capparidaceae; an annual thorny herb, 1 meter high; thrives in a dry soil. Specimens were obtained at Coamo Springs (no. 720), where the name "aromo" is used. Bello reports the name "jasmin del rio" for *Cleome pungens.* (Stahl, **2**: 41.)

Clerodendron aculeatum. BOTON DE ORO.

Family Verbenaceae; a shrub, 5 to 12 feet (1.5 to 3.5 meters) high. From Fajardo. (Stahl, **6**: 218.) Reported by Bello.

Clerodendron fragrans. FLOR DE MUERTO.

A biennial shrub, 1 meter high. Bello reports the common name "jasmin hediondo." (Stahl, **6**: 219.)

Cleyera albopunctata.

Family Theaceae; from vicinity of Maricas.

Clidemia hirta. CAMACEY PELUDO.

Family Melastomaceae; a common shrub, 3 to 8 feet (1 to 2.5 meters) high. (Stahl, **4**: 95.)

Clidemia neglecta. CAMACEY NEGLIGENTE.

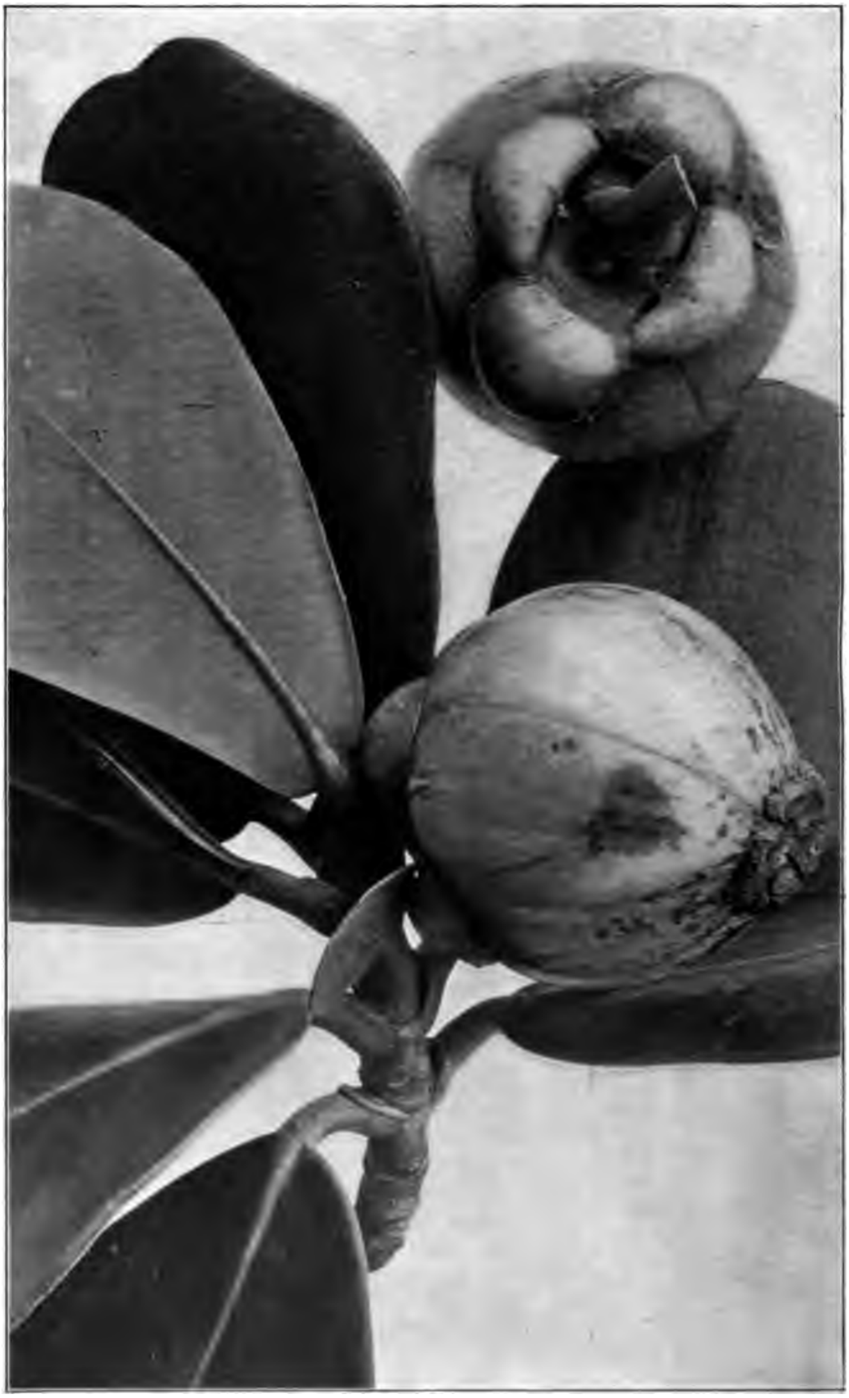
A shrub, 3 to 8 feet (1 to 2.5 meters) high. (Stahl, **4**: 97.)

Clitoria arborescens. CONCHITA ESBELTA.

Family Leguminosae; a high climber, growing in dry places. (Stahl, **3**: 59.)

Clitoria glycinoides. CONCHITA BLANCA.

An annual wild vine, growing in all parts of the island. According to Stahl the flowers are white, and according to Grisebach purple-variegated. Our specimens (nos. 299 and 373) were noted in life to be creamy white, with purplish lines on the banner; on drying they became distinctly yellow. (Stahl, **3**: 58.)



CUPEY (CLUSIA ROSEA). NEAR YAUCO.

Clitoria ternatea. BEJUCO DE CONCHITAS.

A woody annual vine, with handsome blue and white flowers; a native of the East Indies, cultivated in gardens as an ornamental, and frequently escaped in waste places, including dry rocky hillsides. Our specimens were collected near Jobo. (Stahl, **3**: 56.)

Clove. See *Eugenia aromatica.*

Clusia acuminata. CUPEILLO.

Family Guttiferae. (Stahl, **2**: 124.)

Clusia cartilaginosa.

From Cayey; Adjuntas.

Clusia gundlachi. CUPEY DE ALTURA.

A shrub, 3 to 5 meters high; grows above 1,000 feet (300 meters) altitude. The resin is used for rheumatism. From Mariacao and Luquillo. (Stahl, **2**: 122.)

Clusia krigiana. CUPEI.

A shrub or small tree of 3 to 15 meters, reported from Sierra de Luquillo (El Yunque) and from the vicinity of Utuado.

Clusia rosea. CUPEY. PLATE XXVIII.

A wild tree or shrub 3 to 10 meters high. The resin is useful in rheumatism. (Stahl, **2**: 121.)

A wild tree that grows usually as a parasite on other trees, which are often killed by it. The roots spread downward over the trunk until the ground is reached, when other roots are formed, and the tree finally comes to be supported by its own trunk. When grown entirely in the ground, the trunk will not be so tall but thicker and denser. The diameter is from 18 to 24 inches (45 to 60 centimeters), and it sometimes reaches a height of 30 or 40 feet (9 to 12 meters). The wood is reddish and is used only as fuel. Specific gravity, 0.876—(Grosourdy, **2**: 378). Sometimes called "balsam fig" or "balsam tree."

Cnicus portoricensis. See *Carduus mexicanus.*

Cobano. See *Stahlia maritima.*

Cóbana negra.

Makes pretty walking sticks, perfectly black, very similar to ebony, a smoky but not a jet black; takes a high polish.

Cobano.

A tree from the eastern parts of the island: height 50 to 60 feet (15 to 18 meters), diameter 25 to 30 inches (60 to 75 centimeters). Wood very dark and very hard; specific gravity, 1.227; used in boat building. (Exp. 1857.) Said by Stahl to be the same as "cojobana," a name which he applies to *Pithecolobium filicifolium* and to *Piptadenia peregrina.*

Coca. See *Erythroxylon coca.*

Cocaine. See *Erythroxylon coca.*

Coccocypselum repens. BALSAMILLO.

Family Rubiaceae; a creeping tufted annual; stems 18 to 20 inches (45 to 50 centimeters) long, growing in mountains. Bello records the common name "yerba de guava." (Stahl, **5**: 45.)

Coccolobis.

A large West Indian genus of polygonaceous shrubs and trees, many of which bear edible fruits known as "sea grapes" or "uvas del mar," although other more specialized names are used in Porto Rico where the genus is represented by numerous species.

Coccolobis diversifolia. PALO BOBO.

A shrub of 15 feet (5 meters) or less, known throughout the West Indies.

Coccolobis excoriata.

This tree attains a considerable size and is looked upon as a fine timber wood; grows in mountains. (Sunan.)

Coccolobis grandifolia. MORALON.

A large tree of the mountain forests.

Coccolobis kunthiana.

From Utuado.

Coccolobis laurifolia.

Native names: "Uvillo," "glateado," and "uverillo." See note under Coccolobis. From Cabo Rojo.

Coccolobis nivea. CALAMBREÑAS.

A branching tree 20 to 30 feet (6 to 9 meters) in height, with papery leaves, yellowish flowers, and small white edible berries. Specimens were obtained at Coamo Springs (no. 737) and near Ponce (no. 805), the latter with red berries.

Coccolobis obtusifolia. UVILLO.

A shrub of 10 to 12 feet (3 to 4 meters), known from the Bahamas, Santo Domingo, Porto Rico, and the Danish Islands.

Coccolobis pirifolia.

From Bayamon.

Coccolobis rugosa. ORTEGON.

A species with deeply wrinkled leaves 18 inches (45 centimeters) across; collected by Sintenis at Cayey. Also reported by Eggers from the region of El Yunque as *C. macrophylla.* Said to be the most conspicuous tree in some regions, up to an altitude of 2,000 feet, especially when the purple flowering spikes, a yard long, are displayed. A large tree, said to be abundant in Porto Rico, and furnishing an economic wood.

Coccolobis uvifera. SEA GRAPE. UVERO.

Also called "uva del mar," and in Jamaica "pigeon wood." A tree of medium or large size growing near the sea. The berries are described by Grisebach as dark blue and ½ to ⅝ of an inch (12 to 16 millimeters) in length. The wood is esteemed in Jamaica for cabinet work. The plants are propagated by cuttings and the trees grow to a large size.

Coco. See *Cocos mucifera.*

Cocoa plum. See *Chrysobalanus icaco.*

Cocoe. See *Colocasia esculenta.*

Cocorron. See *Elaeodendron xylocarpum.*

A tree reported by Grosourdy as occurring in the eastern part of the island, 30 or 35 feet (9 to 11 meters) high, with a trunk 1 foot or more (30 centimeters) in diameter. It furnishes a yellow wood of medium durability, having a vertical fracture, used in the construction of country houses. (Grosourdy, 2:376.

Cocorroncito. *Elaeodendron attenuatum.*

Cocos aculeata. See *Acrocomia aculeata.*

Cocos mauritia.

A name given by Hill for the "palma moriche." There is no such name or synonym in the Index Kewensis, and the reference is doubtless to ***Mauritia flexuosa***, which is also given by Hill as the botanical name of "moriche."

Cocos nucifera.

The rather extensive use of green cocoanuts for drinking purposes in Porto Rico suggests the question whether the extraction of fiber from the husks might not be undertaken to advantage. This fiber is a regular and important article of export from the East Indies to Europe, under the name of coir, and is used in the manufacture of cordage, bags, brooms, brushes, nets, matting, and other coarse fabrics, and for numerous minor purposes. In some parts of India unripe cocoanuts are used for this purpose, the fiber being finer and more flexible than that of the mature nuts. For the extraction of the fiber the husks are split open upon a sharp stake or crowbar and then soaked in tanks or pits dug in the banks of tidal rivers. The labor of beating out the fibers from the rotted husks is considerable, and the people of Porto Rico could hardly have competed in this with the Hindoos, particularly since the latter have all the experience, but successful machinery has been invented and is now coming into general use, so that when power plants have been established in Porto Rico the possibilities of the extraction of coir will be worthy of further investigation. Very little coir is imported into the United States in the unmanufactured condition, so that plans for any extensive trade must have reference to the European market.

The other important cocoanut export of India and the South Sea Islands is copra, the dried meat of the nut. It is imported into Europe and America for the sake of the cocoanut oil, which is extracted from it to the amount of 30 to 60 per cent of its weight, depending upon quality and the degree of dryness. The Treasury reports for 1899 show importations of:

Copra	2,071,037 pounds, valued at $109,421
Cocoanut oil	21,794,633 pounds, valued at $1,034,710

Something over another million dollars was paid for cocoanuts in the shell and in other forms.

Cocoanut oil is used extensively for food, in the Far East as a substitute for butter, lard, or olive oil, and is also burned for illumination. In Europe and the United States it is employed mostly in the manufacture of candles and soaps, but in the latter form it has the disadvantage of having a disagreeable smell. At cool temperatures, 40° to 60°, it becomes solid, but in the Tropics it remains fluid. The "cake," left after the oil has been extracted, is used quite after the manner of cottonseed. Copra is used much more extensively in Europe than in this country, but recent statistics are not available. The trade is, however, known to have suffered in recent years from the competition of the African palm oil—secured from *Elaeis guineensis*, which is superior to cocoanut oil for the purpose of soap making—and has probably been further affected by our cottonseed oil.

As a minor local use of the cocoanut, may be mentioned the employment of the roots as one of the ingredients of the numerous refreshing drinks so popular in Porto Rico.

Grosourdy (**2:** 405) states that the wood is used in the same manner as that of the royal palm, and some parts are more highly prized, being harder, handsomer, and more suitable for fine work; specific gravity 0.501 and 0.865.

Cocotero. See *Cocos nucifera.*

This is the name for the cocoanut tree, but it is little used, both the tree and the nut being commonly called coco.

Coco wood. See *Inga vera.*

Coffea arabica. COFFEE. CAFÉ.

Coffee is the most important product of Porto Rico, and its culture is too extensive a subject to be more than touched on here. The question of shade has been made the subject of a special publication. (See Bulletin No. 25, Division of Botany, United States Department of Agriculture.)

The most careless and wasteful methods are practiced in the culture of this important crop. No attention is paid to the selection of seedlings, most of the new plants being secured from seeds that have germinated under the trees in the old plantations. It is estimated that by proper methods of cultivation the yield from the land now devoted to coffee could be doubled or tripled.

Coffee is a very popular beverage on the island. As usually prepared it is very black, due, in part, to the custom of roasting the beans with sugar. This is sometimes added when the roasting is nearly completed and is supposed to coat the beans with a thin layer of burnt sugar, which helps to retain the aroma.

Coffee. See *Coffea arabica.*

Cohune nut. See *Attalea cohune.*

Coitre. See *Commelina.*

Coix lachryma-jobi. Job's tears. Camandula. Plate XXIX.

A grass with large oval, very hard seeds, smooth and polished, and of a light pearly-gray color; they are sometimes strung for beads or rosaries. This species is not uncommon in waste places in Porto Rico.

Cojoba. See *Copaifera hymenaeifolia* and *Acacia berteriana.*

According to Captain Hansard cojoba wood is used for posts and fencing; specific gravity, 0.60.

A wild tree found sparingly in the eastern part of the island, 40 to 50 feet (12 to 15 meters) high, 2 feet (60 centimeters) in diameter; furnishes a wood that is flesh-colored, very hard, breaking vertically with great difficulty; used in boat building and for fences, in which case it strikes root; also called "palo de hierro," and "quiebra hacha." (Grosourdy, **2**: 376.)

Cojoba blanca.

A tree from the eastern part of the island; height, 50 to 60 feet (15 to 18 meters); diameter, 12 to 15 inches. Wood white, very hard; specific gravity, 0.928; used in boat building. (Exp. 1857.)

Cojoba negra.

A tree from the eastern part of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood dark, very hard; specific gravity, 0.994; used in boat building. (Exp. 1857.)

Cojobana. See *Piptadenia peregrina* and *Pithecolobium filicifolium.*

Grosourdy (**2**: 376) refers this name and "cobana" to ***Swietenia mahagoni.***

Cojobilla. See *Piptadenia peregrina.*

Bello reports this name under *Acacia angustiloba.*

Cola. See *Cola acuminata.*

Cola acuminata. Cola.

The cola tree was introduced into the West Indies from West Africa during slave trading times for the benefit of the slaves. It has become naturalized in Trinidad and probably in other islands.

Coladilla. See *Polypodium polypodioides.*

Coleus amboinicus. See *Coleus aromaticus.*

Coleus aromaticus.

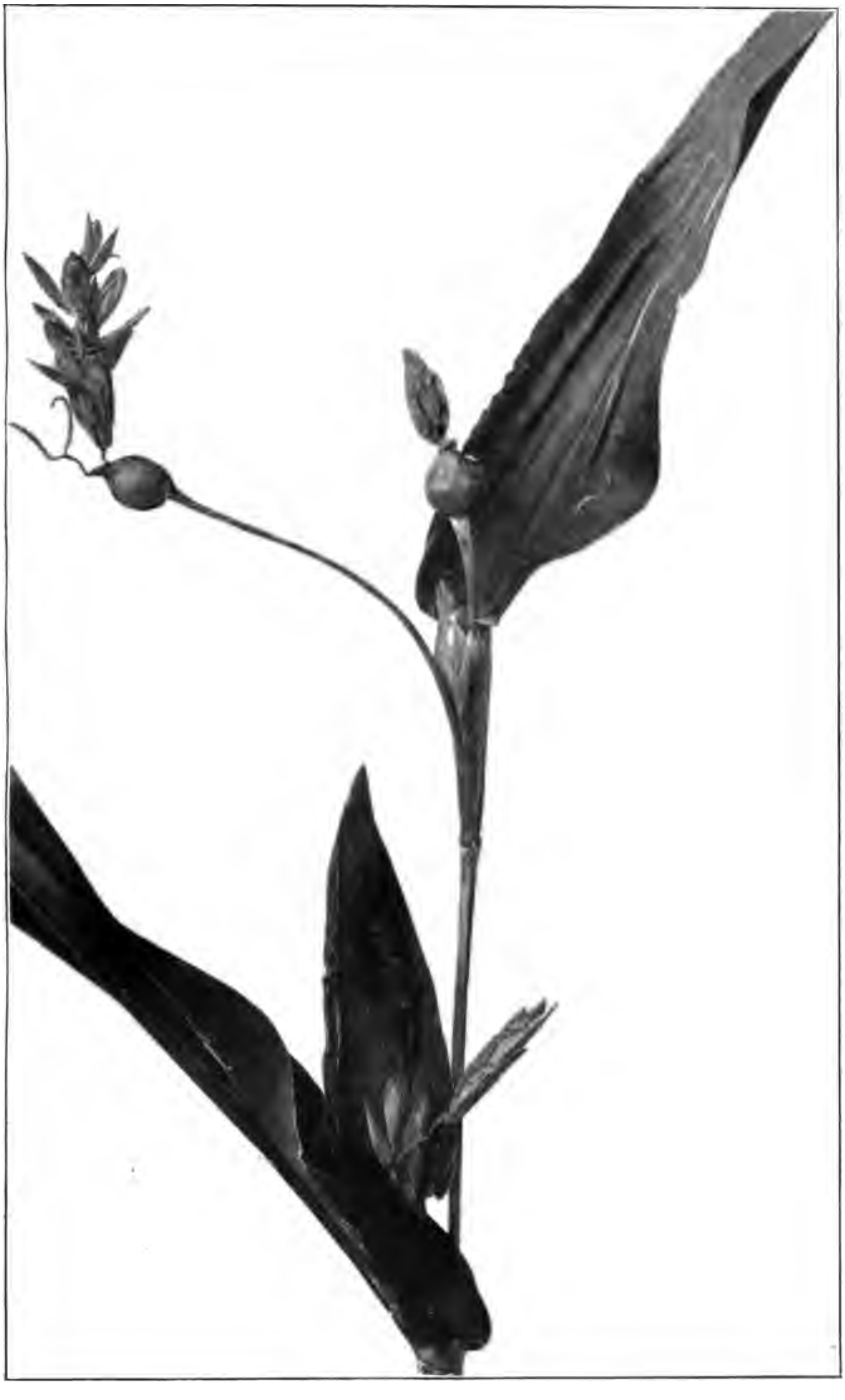
Family Labiatae. Bello reports the name "oregano de Espana" for *Coleus amboinicus.* (Stahl, **6**: 170.)

Collards. See *Brassica oleracea.*

Colocasia esculenta. Taro. Yautiá malanga. Bleeding heart.

Family Araceae; the "taro" of Polynesia.

Elsewhere about the Caribbean Sea the same plant has a most confusing variety of native names, "coco" in Jamaica, "eddo" in Barbados, "tannia" in Trinidad, "taya" in the French islands, "oto" on the Isthmus of Panama, and "tiquisquis" in Nicaragua. European travelers and residents are commonly not aware of the differences between these closely similar plants, and generally apply these names indiscriminately to both Colocasia and Xanthosma, and some botanists have even failed to appreciate the differences.



JOB'S TEARS (COIX LACHRYMA-JOBI).

The species of Colocasia can be distinguished from those of Xanthosma by the peltate leaves.

Mr. W. M. Armstrong, of Honolulu, states that he found the Porto Rican taro, or yautia, invariably inferior to the Hawaiian, the introduction of which he considers would be an important service for the agricultural population of Porto Rico. Stock should be secured from Hilo through the experiment station authorities.

Mr. Armstrong also states that the Hawaiian taro has been found superior to that of Fiji and Samoa by Mr. Alexander, who has investigated the subject. Its wholesome and delicate quality recommend it to resident Americans, and many who have returned to California now import taro for household use.

Recently the Chinese have taken to raising another variety of taro, or taro-like plant, in California, particularly at Bakersfield. This is said to be propagated from tuberous lateral shoots, not like the taro in which the leafy cut-off ends are planted. Chinese taro is also imported to California from Canton and Hongkong. This is by some thought to be somewhat inferior to the Hawaiian, but the difference is not great.

Coloquintilla. See *Cayaponia racemosa.*

Colubrina ferruginosa. SNAKE WOOD. ABELLUELLO.

Family Rhamnaceae; a tree 15 to 20 meters high, found in mountains. Stahl states that this species is also called "quitaran." (Stahl, **4:** 45.)

Colubrina reclinata. MABI.

A shrub or low tree found in the mountains; 15 to 20 meters high. From near Guanica. (Stahl, **4:** 46.)

Called "palo mabi" by Grosourdy (**2:** 366), who says the wood is strong and durable and is used in Cuba for building. Specific gravity, 0.947.

Both this and the following species are said to be used to make the drink called "mabi." (*Ceanothus reclinatus.*)

Columnea hispida. See *Columnea tulae.*

Columnea tulae. TIBEY PARASITO.

Family Gesneriaceae; an annual 50 centimeters high, found in high mountains. Stahl's *C. hispida* is found by Urban not to be Swartz's species of that name and is redescribed as variety *flava* of *C. tulae*, the flowers being yellow instead of red. (Urban, Symb. **1:** 410.)

Commelina. COITRE.

Several species of Commelina are common in Porto Rico and all seem to be called "coitre."

Comocladia.

A West Indian genus belonging to the family Anacardiaceae and having a poisonous juice similar to that of poison ivy and other species of Rhus. All the species are shrubs or trees with compound leaves and nearly all have the margins of the leaflets armed with pointed teeth into which the veins are produced.

This peculiarity, while not unique, will assist in the recognition of the species with which those who have occasion to visit West Indian forests will do well to become acquainted. In Cuba species of Comocladia are called "guao," in Porto Rico "carrasco," and in Santo Domingo "chicarron." In his last revision of the genus Professor Engler, of Berlin, recognized nine species. While several of these are represented in the National Herbarium, there are also several new forms, including three from Porto Rico, making ten species available for study.

Comocladia acuminata. CARRASCO.

A shrub 2 to 3 meters high; found at the base of the mountains; said to be poisonous.

Comocladia ilicifolia. CARRASCO.

A shrub 2 or 3 meters high found on the south coast of the island. (Stahl, 4: 59.)

Conchita blanca. See *Clitoria glycinoides.*

Conchita de Plumier. See *Centrosema plumieri.*

Conchita esbelta. See *Clitoria arborescens.*

Conchita laurifolia. See *Centrosema laurifolia.*

Conchita peluda. See *Centrosema pubescens.*

Conchita Virginia. See *Centrosema virginianum.*

Concombre. See *Cucumis anguria.*

This common name is applied at San Juan; at Ponce *Cucumis anguria* is called *pepino* or *pepinito.*

Condalia ferrea. See *Scuta ferrea*

Congo pea. See *Cajanus cajan.*

Congo.

A variety of banana. See *Musa.*

Conocarpus erectus. MANGLE BOTON.

Family Combretaceae; a shrub 5 meters high, growing in mangrove swamps. In Jamaica called "alder" or "button tree," and esteemed as fire wood. (Stahl, 4: 137.)

A wild tree abundant on the coasts, 20 to 25 feet (6 to 8 meters) high, 9 to 10 inches (22 to 35 centimeters) in diameter. It furnishes a wood very hard and heavy, fibrous in texture, fine-grained, and compact. When freshly worked it is gray tinted with light chocolate with narrow undulous light lines; after it has been worked for some time it becomes darker. For a long time the wood keeps the marshy odor of the swamps. Specific gravity, 1.009. Used in building boats and barges, also for shelving, being very durable when grown on dry ground. It is used also to make charcoal for forges. (Grosourdy, 2: 399.)

Conradia. See *Pentarhaphia reticulata.*

Conradia reticulata. See *Pentarhaphia reticulata.*

Contrayerva. See *Aristolochia.*

Convolvulus jamaicensis. AGUINALDO BLANCA DE COSTA.

Family Convolvulaceae; a wild vine growing in savannas and along the coast. (Stahl, 6: 169.)

Convolvulus nodiflorus. AGUINALDO BLANCO.

A creeping plant, found in waste places on the south coast of the island. (Stahl, 6: 170.)

Convolvulus pentanthus. AGUINALDO AZUL.

Wild in waste places and arid regions. (Stahl, 6: 168.)

Copaifera hymenaeifolia. COJOBA.

Baron Eggers expresses in the Kew Bulletin for 1890 the opinion that this species is confined to Cuba. It is enumerated by Hill among Porto Rican forest trees.

Copaifera officinalis. PALO DE ACEITE.

A wild tree, rather large and dense, which at first sight slightly resembles the walnut of Europe. It is 40 to 50 feet (12 to 15 meters) high with a rather straight trunk 12 to 18 inches (30 to 45 centimeters) in diameter. It furnishes a good wood, rather hard, very handsome, of good weight, fibrous in texture, but rather compact and fine-grained. The general color is brownish or sometimes about the color of dead leaves beautified with black markings and resembling walnut. The shavings have the odor of copaiba balsam. The wood is used for building and general carpenter work, for making wheels of carts and carriages, for turning and for adorning the interior of houses, also for furniture. Specific gravity 0.777. (Grosourdy, 2: 378.)

Copaiva. See *Copaifera.*

Copillo. See *Cordia globosa.*

Coral.

A tree from the western parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood pinkish, hard; specific gravity 1.247; used in house building. (Exp. 1857.)

Coral bean. See *Erythrina corallodendron.*

Coralillo. See *Antigonon leptopus.*

Coralillo rosado. See *Antigonon leptopus.*

Coralitos. See *Adenanthera pavonina.*

Corazon. See *Anona reticulata.*

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 12 inches (30 centimeters). Wood yellow, soft; specific gravity, 0.650; little used. (Exp. 1857.)

According to Captain Hansard this is the "bull's heart" or "sweet sop" of the British Islands. The specific gravity of the wood is 0.65. According to Grisebach the name "sweet sop" is applied both to *Anona squamosa* and *A. sericea*, while in the Treasury of Botany the "bullock's heart" of the West Indies is said to be *A. reticulata.*

Corazon cimarron. See *Anona palustris* and *Rollinia multiflora.*

Corcho. See *Anona palustris.*

A cork tree, with very soft wood and umbrella-like leaves; very rare.

Corcho blanco.

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood white, very soft; specific gravity, 0.555; not used. (Exp. 1857.)

Corcho prieto.

A tree from all parts of the islands; height, 30 to 35 feet (9 to 11 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood light, soft; specific gravity, 0.558; not used. (Exp. 1857.)

Corchorus hirsutus. MALVA TÉ DE LA PLAYA.

Family Tiliaceae; a shrub 2 to 6 feet (0.6 to 2 meters) high, found along the seacoast. A specimen collected at Santurce (no. 293), and there called "cadillo," agrees fairly well with a sheet from St. Croix in the National Herbarium, but is much less hirsute than material from other parts of the West Indies and South America. A variety, *tortipes*, was obtained by Sintenis at Aguadilla, who also secured the typical form at Guanica. (Stahl, 2: 117.)

Corchorus hirtus. MALVA TÉ.

A woody herb. (Stahl, 2: 115.)

Corchorus siliquosus. MALVA TÉ. BROOMWEED.

A woody shrub, 1 to 3 feet (0.3 to 1 meter) high, frequenting stony and sandy places; used by the natives of the West Indies for making brooms; the leaves used for tea. (Stahl, 2: 116.)

Cordia.

A large genus of boraginaceous trees yielding medicinal drugs, edible fruits, and valuable timber. In the characters of habit, leaves, and inflorescence the species of Cordia are extremely diverse, and there also appears to be considerable confusion as to the identity of closely allied species.

Cordia alba. CEREZAS BLANCAS.

Family Boraginaceae. According to Grisebach this is a tree 30 feet (9 meters) high. Stahl says that it is a shrub 9 to 12 feet (3 to 4 meters) high with slender branches trailing over the surrounding vegetation. From Peñuelas.

Grosourdy gives the native name "capa blanco" and agrees with Grisebach in the dimensions, describing it as a tree 30 to 45 feet (9 to 14 meters) high with a rather dense top. The trunk is moderately long, about 3 feet (1 meter) in diameter, and rather crooked. The wood is very hard and strong, dark yellow in color, breaking with an oblique fracture. It is very lasting and highly esteemed. Extensively employed by the military authorities of San Juan for gun carriages, hubs of wheels, carpenter benches, vises, etc. It is also used in making fine furniture and in the construction of buildings and for farm utensils. (Grosourdy, **2**: 370.)

Cordia bellonis.

A shrub from the vicinity of Maricao. (Urban, Symb. **1**: 393.)

Cordia borinquensis. MUÑECA.

Also called "palo de Muñeca." A tree attaining 20 meters, recently described as a new species; reported from numerous localities. (Urban, **1**: 390.) From Isabon, Sierra de Naguabo, and near Utuado.

Cordia collococca. CEREZAS.

A tree 5 meters high, with white bark; wood soft, brittle, and little used; found in all parts of the island except the central part and the north coast. In Jamaica this tree is said to reach a height of 50 feet (15 meters). The fruit is eaten by fowls. (Stahl, **6**: 271.)

Cordia elliptica. CEREZAS CIMARRONAS.

A forest tree 30 feet (9 meters) high; more abundant on the south side of the island. (Stahl, **6**: 93.)

Cordia gerascanthus. CAPÁ PRIETA.

A tree 30 to 60 feet (9 to 18 meters) high; wood used for furniture; found in mountainous regions. In Jamaica the wood of this tree is called "prince wood" and is considered one of the best woods. The small saplings make good hoops for hogsheads. It resembles the elm and is called Spanish elm. (Stahl, **6**: 91.)

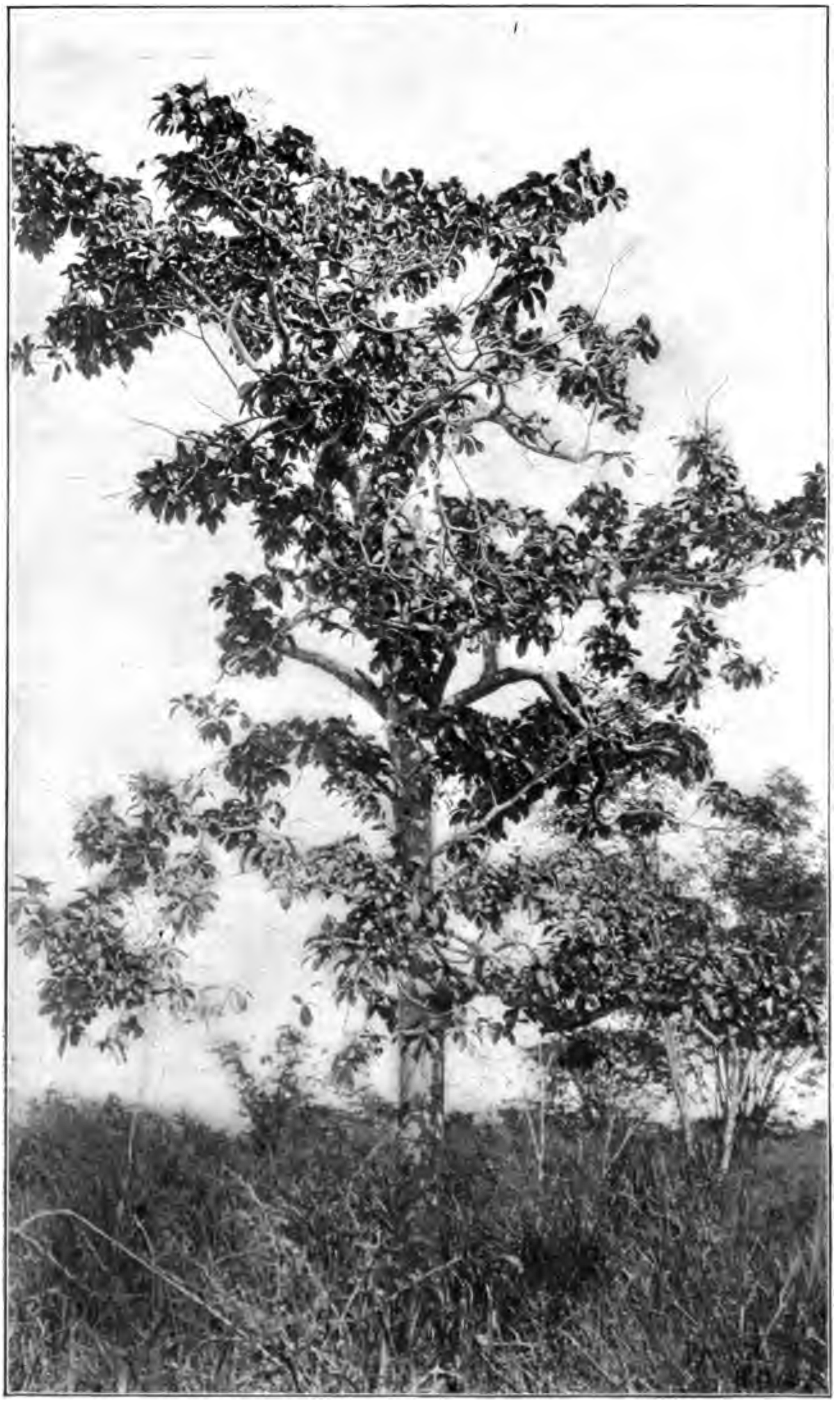
Grosourdy gives the native name "palo de rosa," and reports it also from Vieques.

A wild tree 30 feet high with a trunk 18 inches in diameter. Furnishes a rose-colored wood that breaks with a vertical fracture. Employed in the construction of crude houses and in building boats. It is also much appreciated for making furniture. The name "palo de rosa" has been applied to various different woods taken from South America to Europe, one of which is the "palissandre" of the French; another (*Amyris balsamifera*), also called rosewood, candle wood, and sweetwood, is very little used. The English rosewood is *Amyris montana*, which is also called yellow candle and yellow sander in Jamaica. (Grousourdy, **2**: 407.) On page 307 this author reports the same species under the native name "capa prieta," and after giving slightly different dimensions, supplies the following data:

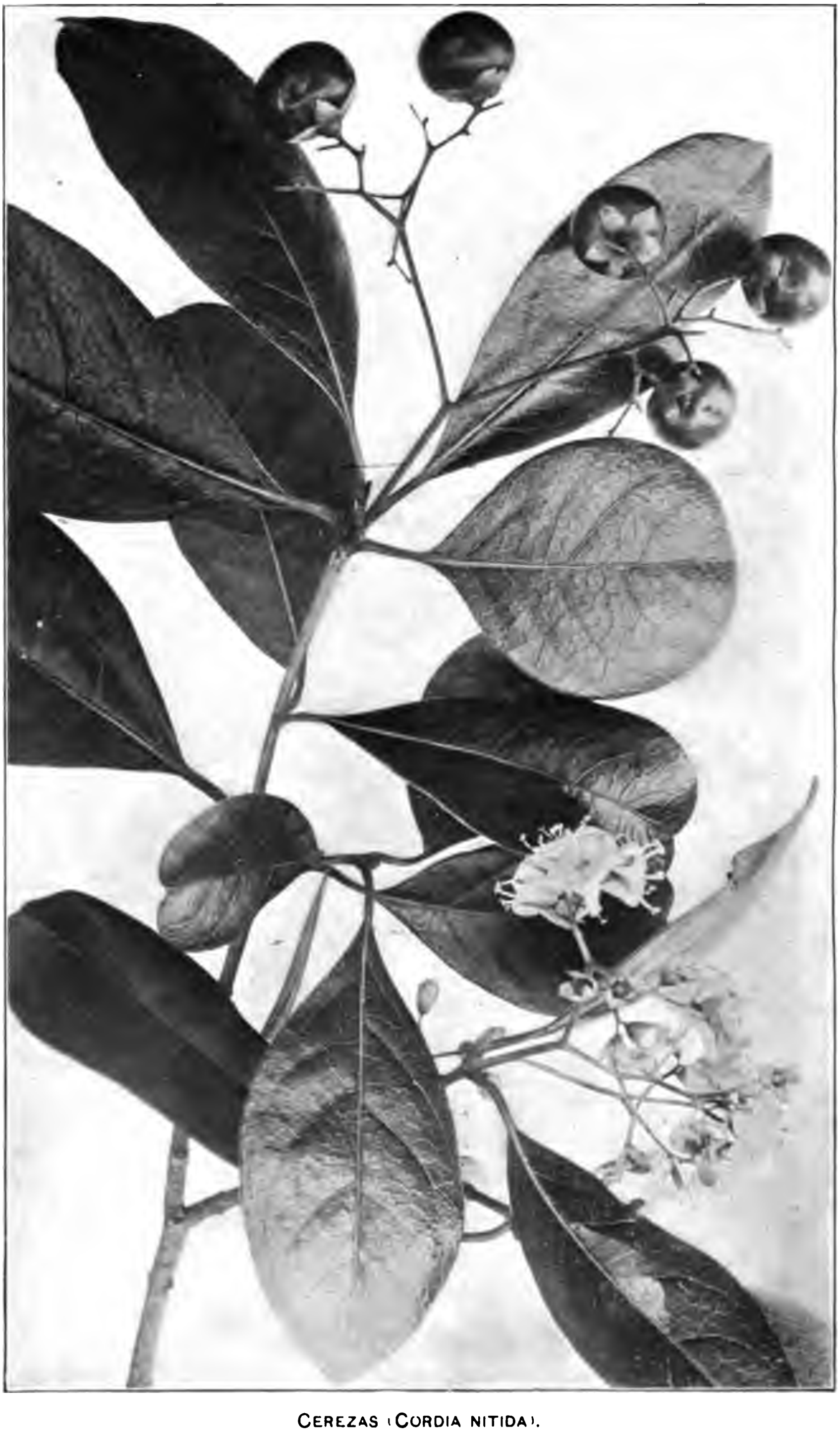
> A wild tree which is 40 feet (12 meters) in height with a trunk 21 to 27 feet (7 to 9 meters) long and 10 inches in diameter. Found commonly in mountainous localities. The wood is of ordinary weight, very strong, and frequently very elastic, the color of dead leaves, sometimes gray, fibrous in texture, rather fine-grained. Specific gravity, 0.574. The wood is much appreciated and was employed by the military authorities of San Juan in making windlasses, gun carriages, arms for fencing, etc. Also used for doors, venetian blinds, cots, bungs of barrels, the sweeps of sugar mills, and ordinary furniture.

Cordia gerascanthoides. CAPÁ PRIETA.

A tree that reaches 60 feet (18 meters) in height and whose trunk is 18 inches (45 centimeters) in diameter. Furnishes a wood that is much appreciated, for it



MORAL TREE (CORDIA MACROPHYLLA). COAMO SPRINGS.



CEREZAS (CORDIA NITIDA).

is at the same time strong and somewhat flexible, elastic, hard, more than ordinarily heavy, fibrous in texture, with a fine, compact grain. The heart is very hard, chestnut-colored, ornamented with lighter lines that are sometimes reddish. The outside wood is gray to light yellow, with narrow lines of a darker color. The wood is susceptible of a high polish, very beautiful when varnished. Specific gravity, 0.754 or 0.752. The military authorities of San Juan used this wood for axles, gun carriages, etc. Also made into doors, venetian blinds, beds, carriages, beehives, etc. Bees are attracted to its fragrant flowers, and cattle and hogs to the fruit. (Grosourdy, 2: 364.)

Cordia globosa. Copillo.

According to Grisebach, a shrub 6 to 10 feet (2 to 3 meters) high, found in dry soil along the coast. According to Stahl a low shrub 4 inches (10 centimeters) high in salt marshes. From Cabo Rojo. (Stahl, 6: 96.)

Cordia macrophylla. Moral. Plate XXX.

A forest tree 8 meters high, found, according to Grisebach, in all inland woods. Wood little used; in Jamaica it is claimed to be a good timber wood. (Stahl, 6 : 92.)

Cordia nitida. Cerezas. Plate XXXI.

A small tree along the road between Ponce and Adjuntas. The flowers are greenish white and the berries cherry red. The pulp of the latter is used for gluing musical instruments.

Cordia rupicola.

A shrub of 4 or 5 meters, from the southwestern part of the island. From vicinity of Guanica. (Urban, 1: 392.)

Cordia sebestena. Vomitel colorado. Aloe-wood.

A shrub 3 to 4 meters high, found wild on the eastern coast. Cultivated in gardens for its beautiful flowers. (Stahl, 6: 96.)

A variety *brachycalyx* has recently been described by Urban, who states that the genuine *sebestana* is not known from the island except in cultivation. The additional popular name "San Bartolome" is also given. (Urban, Symb. 1 : 389.)

Cordia ulmifolia. Palo de perico.

A shrub 6 to 15 feet (2 to 5 meters) high, found in rocky waste places. Bello records the name "basora prieta" for this species. (Stahl, 6: 94.)

The variety *ovata* is reported from Peñuelas by Urban on the basis of specimens secured by Sintenis.

Cordobancillo. See *Rondeletia arborescens* and *R. laevigata*, and *R. inermis*.

Corkwood. See *Ochroma lagopus* and *Anona palustris*.

Cornutia obovata.

Family Verbenaceae; an indigenous tree attaining a height of 10 meters; known only from the vicinity of Barranquitas.

Cororron.

A tree from the eastern parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood yellow, rather hard; specific gravity, 0.862; used in building country houses. (Exp. 1857.)

Corozo. See *Acrocomia media*.

Corozo del Orinoco. See *Martinezia caryotaefolia*.

A palm of the family Cocaceae. This name was unknown to Captain Hansard.

Corynella paucifolia. Retama.

A leguminous shrub, attaining 2 meters in height, with blue flowers. Known from Yauco and San German.

Coscarron.

According to Captain Hansard the specific gravity is 0.90.

Cosmos caudatus. MARGARITA.

Family Compositae; a common weed in open places. Near Toa Baja this was called "claveles," and at Coamo "piquete." (Stahl, 5: 130.)

Cotona.

A tree from all parts of the island; height. 25 to 30 feet (7 to 9 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood hard, yellow; specific gravity, 1.194; used in building country houses. (Exp. 1857.)

Captain Hansard gives a specific gravity of 0.90 for this tree.

Cotorra.

A wild tree, produced in abundance over the entire island, 30 to 35 feet (9 to 11 meters) high, with a trunk 8 to 10 inches (20 to 25 centimeters) in diameter. It furnishes a moderately hard wood, canary-yellow in color, breaking with a vertical fracture. Used in the framework of country houses, for fences and other uses of this class. (Grosourdy, 2: 378.)

Cotorrera. See *Heliotropium indicum.*

Cotorrera de agua. See *Heliotropium inundatum.*

Cotorrera de la playa. See *Heliotropium curassavicum.*

Cotorrerilla. See *Heliotropium parviflorum.*

Cotorrerillo. See *Casearia bicolor* and *C. samyda.*

Cotorillo. See *Elephantopus tomentosus.*

Cotton.

Cotton nankeen. See *Gossypium religiosum.*

Cotton tree. See *Ceiba pentandra.*

Courbaril. See *Hymenaea courbaril.*

Cowhage. See *Mucuna pruriens.*

Cowitch. See *Mucuna pruriens.*

Coyure. See *Curima colophylla.*

In his account of this palm Mr. Hill has probably confused the royal palm with the llume. There is nothing to indicate reference to the small, spiny palm to which the name is in reality applied, at least in the vicinity of Vega Baja.

Cracca aniloides. AÑIL FALSO.

Family Viciaceae; an herbaceous annual, 40 centimeters high; flowers in November; reported from the beach of the east coast. (Stahl, 3: 28, as *Tephrosia aniloides.*)

Cracca cinerea. AÑIL CENIZO.

A woody herb, 40 centimeters high, found along the beach; flowers all the year. Common throughout tropical America. Specimens collected along the seashore at Cataño, where the plant is called simply añil, and is used as a blue dye for cloth. (Stahl, 3: 26, as *Tephrosia cinerea.*)

Cracca leptostachya. AÑIL RACIMILLO.

An herbaceous annual, 50 centimeters high, growing along the sandy shore, between Arecibo and Aguadilla. Common to the tropics of America and Africa. (Stahl, 3: 27, as *Tephrosia leptostachya.*)

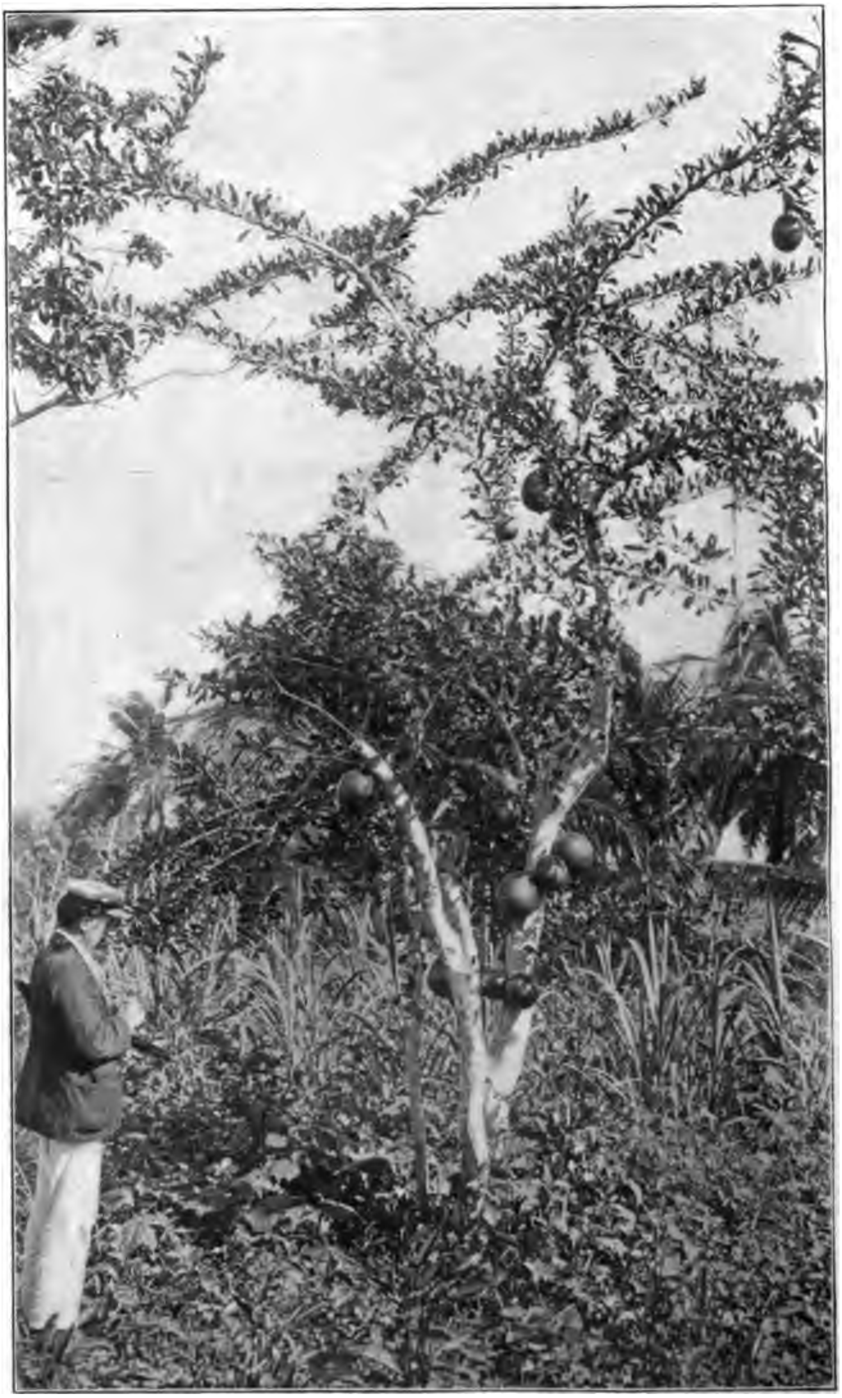
Cracca purpurea. AÑIL RACIMILLO.

Craniolaria annua. ESCORZONERA.

Family Martyniaceae; an herb a meter high. The large fleshy roots are used as a substitute for the European "escorzonera." (Stahl, 6: 264.)

Crape myrtle. See *Lagerstroemia indica.*

Cremanium amygdalinum. See *Tamonea integrifolia.*



CALABASH TREE (CRESCENTIA CUJETE). NEAR RIO PIEDRAS.

Crescentia cucurbitina. HIGÜERILLA.

Family Bignoniaceae. From Aguada. (Stahl, **6**: 184.)

Crescentia cujete. HIGÜERA. CALABASH. PLATE XXXII.

A tree, according to Lunan, growing about 20 feet (6 meters) high. The fruit is used for receptacles of various kinds, while the juice acts as a purge and is said to cause abortion in cattle. The pulp with other ingredients forms an excellent cough remedy. The wood is used in Jamaica for shafts, saddles, chairs, and other articles that require a tough, flexible wood. (Stahl, **6**: 183.)

In Mexico and other Spanish-American countries the common name is "jícara."

Crescentia microcarpa. HIGÜERITO.

(Stahl, **6**: 184.)

Cresta de gallo blanco. See *Teramnus uncinatus.*

Critonia dalea. See *Eupatorium dalea.*

Critonia parviflora.

The variety *portoricensis* is reported from Maricao.

Crotalaria incana. CASCABELILLO VACÍO.

An herbaceous, pubescent annual with trifoliate leaves, growing in dry, rocky places. From Cayey, along the road. (Stahl, **3**: 24.)

Crotalaria lotifolia. CASCABELILLO AXILAR.

A slender, small-leaved shrub, 75 centimeters high; found at San Juan, Fajardo, Coamo, and Guanica. (Stahl, **3**: 25.)

Crotalaria retusa. MATRACA.

A common leguminous weed with showy yellow and maroon flowers; frequent in open waste places. In India this species is cultivated for its fiber. A near relative, *C. juncea*, is the sunn hemp plant of India, a shrub 10 feet or more in height, extensively grown for its fiber, which is said to be better than jute. It was introduced by the Department some years since for planting in the Southern States, but the fiber did not prove to be of good quality except in Florida. An experiment in Porto Rico is desirable, particularly since *C. juncea* is considered of value in India for forage as well as for fiber. According to Stahl the common name of *C. retusa* is "cascabelillo grande," while Bello calls it "sonajuelas."

Crotalaria stipularia. CASCABELILLO ALADO.

An herb 50 centimeters high. (Stahl, **3**: 22.)

Croton.

Family Euphorbiaceae; numerous species of shrubs of this genus are known in Porto Rico. *C. discolor* is reported from Ponce.

Croton flavus rigidus.

This plant is said to be used in baths, for nervous weakness. From Guanica.

Croton humilis.

A shrub 1 to 2 feet (30 to 60 centimeters) high. Called "seaside balsam" in Jamaica. From vicinity of Guanica.

Croton lucidus.

A shrub 5 to 6 feet (1.5 to 2 meters) high. From Salinas de Cabo Rojo.

Cryptomeria.

Like most tropical countries, Porto Rico is deficient in coniferous trees. It is not, however, impossible that *Cryptomeria japonica*, the largest and perhaps the most beautiful of Japanese evergreens, might be found to flourish at the higher altitudes. This species, while it will endure frost, thrives also in mild, moist climates, and has been very successfully cultivated in the Azores for its valuable timber.

Cryptostegia grandiflora.

An East Indian asclepiadaceous vine; has been introduced into Jamaica. It is said to produce rubber of good quality, but the latex is not abundant and collection is slow and difficult.

Cuabilla. See *Amyris elemifera.*

A Cuban name not yet recorded in Porto Rico.

Cuba bark. See *Paritium elatum.*

Cucubano.

A tree from all parts of the island; height, 35 to 40 feet (11 or 12 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood rather hard, ash-colored; specific gravity, 0.888; used in building country houses. (Exp. 1857.) (Grosourdy, **2**: 379). Captain Hansard says that it is mostly of small size, the saplings, measuring about 3 inches (7 centimeters), being used in hut building; specific gravity, 0.84.

Cucumber. See *Cucumis anguria* and *C. sativus.*

Cucumis anguria. Concombre. Anguria. Pepino. Plate XXXIII.

Family Cucurbitaceae. In Cuba called "pepino cimarron;" an annual cucurbitaceous vine with small oval spiny fruits, which are used as a substitute for the common cucumber and are commonly sold in the markets. (Stahl, **4**: 178.)

Cucumis citrullus. See *Citrullus vulgaris.*

Cucumis melo. Melon.

The introduced muskmelon. (Stahl, **4**: 179.)

Muskmelons are not an uncommon fruit in the markets of Porto Rico, and several varieties were observed. All were, however, lacking in flavor.

Cucuracey.

A tree from the eastern parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood rather hard, pinkish; specific gravity, 0.897; used in building houses in the country. (Exp. 1857.)

Cucurbita pepo. Squash. Calabaza.

Several varieties of squashes were seen in the markets of San Juan and Ponce, but mostly of small size.

Cuenta de oro.

"Golden bead;" a large tree with orange-yellow fruit; not yet identified.

Cuernecillo. See *Morongia distachya* and *Helicteres jamaicensis.*

Cuero de sapo. See *Exostemma caribaeum*, *Ilex dioica*, *I. nitida*, and *I. urbaniana.*

"Frog's skin;" a tree of small size; soft bark; used in hut building; plentiful in the mountains; not known in lowlands. Captain Hansard gives a specific gravity of 0.89 for this.

A tree from all parts of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 12 to 15 inches (30 to 45 centimeters). Wood yellow, rather hard; specific gravity, 1.883; not used. (Exp. 1857.)

Used for fuel in the country districts. (Grosourdy, **2**: 380.)

Culantrillo. See *Scoparia dulcis.*

Culantrillo de Pozo.

No. 231. An unidentified species of Adiantum.

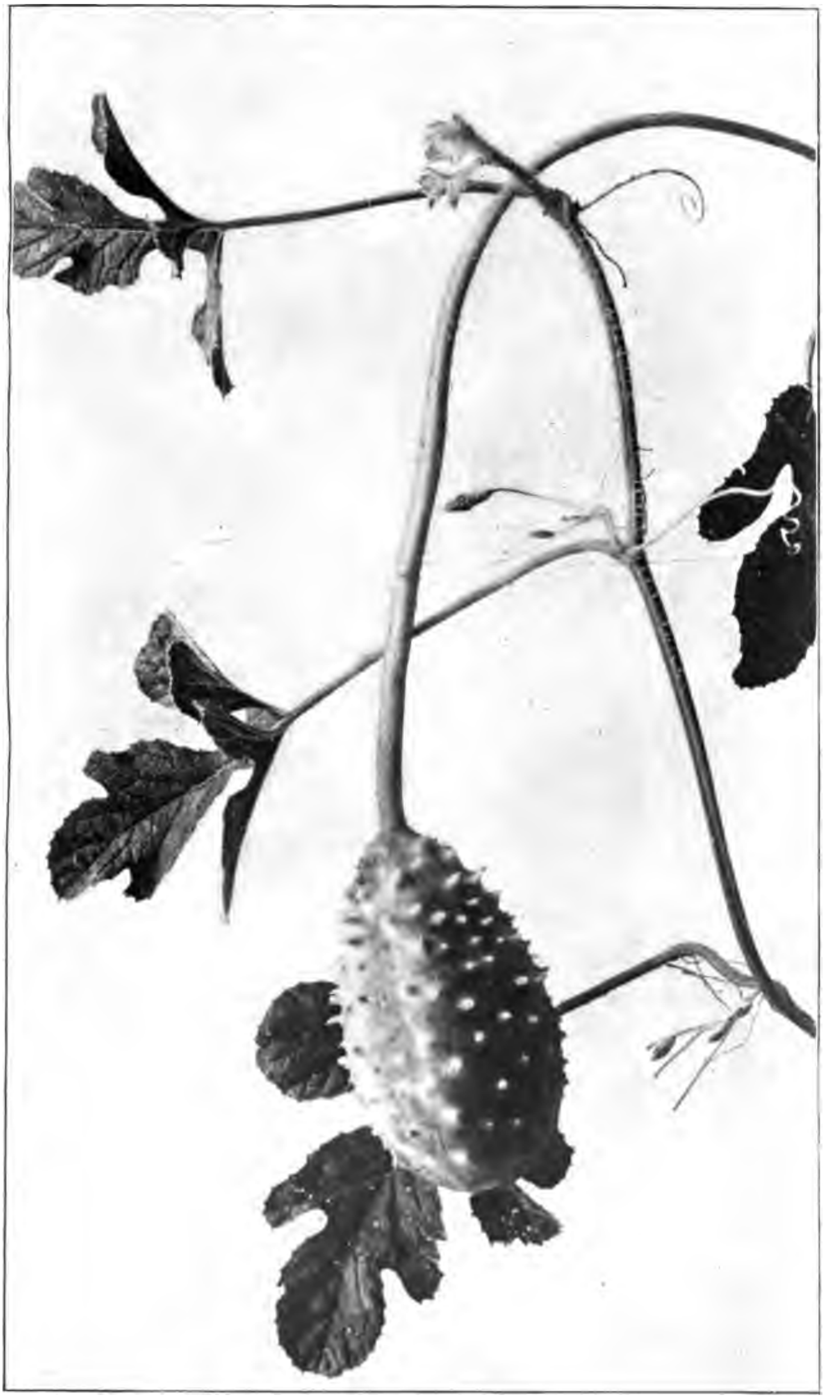
Culantro del monte. See *Eryngium foetidum.*

Cundeamor. See *Momordica charantia.*

Cupania americana. Guara.

Family Sapindaceae; a forest tree, 5 meters high. The soft wood takes a high polish. (Stahl, **2**: 156.)

PLATE XXXIII.



CONCOMBRE (CUCUMIS ANGURIA).

Cupania sapida. See *Blighia sapida.*

Cupania tomentosa. See *Cupania americana.*

Cupei. See *Clusia krugiana.*

Cupeillo. See *Clusia krugiana* and *C. acuminata.*

Cupey. See *Clusia rosea.*

A tree from all parts of the island; height, 20 to 30 feet (6 to 9 meters); diameter, 6 to 8 inches (15 to 20 centimeters); wood yellow, rather hard; specific gravity, 1.058; kills trees to which it attaches itself. (Exp. 1857.)

Cupey colorado.

A tree from the interior parts of the island; height, 50 to 60 feet (15 to 18 meters); diameter, 15 to 20 inches (37 to 50 centimeters); wood hard, red; specific gravity, 0.874; used in building houses. (Exp. 1857.)

Cupey de altura. See *Clusia gundlachi.*

Cuphea micrantha. CHIAGARI.

Family Lythraceae; small shrub, 30 centimeters high, growing along the coast. The same common name is also applied to *Cuphea parsonsia*, a smaller species, only 15 centimeters high. (Stahl, **4:** 125.)

Curbaril. See *Hymenaea courbaril.*

Curcuma longa. TURMERIC. YUQUILLO.

An introduced zingiberaceous plant running wild in Jamaica, and probably also in Porto Rico. The roots are used as an ingredient in curry powders, and also produce a yellow dye much used in India. The yellow principle is not developed until the roots mature, and in the younger state they are used much like arrowroot, starch being extracted from them.

Curia. See *Dianthera pectoralis.*

Curima calophylla. COYURE.

Family Arecaceae: Curima appeared to be especially abundant about Bayamon, but is probably rather generally distributed in the limestone hills of the island, perhaps also on other soils. A few trees were seen along the road between Utuado and Lares, and numerous others between Isolina and Manati. Sintenis collected specimens of what is apparently the same species near Juncos and Hato Grande, and young specimens at Maricao.

As far as Porto Rico is concerned, this palm is very easily recognized by means of the curiously truncate leaf divisions, the outer margins of which appear as though accidentally injured or eaten away by caterpillars. This feature is, however, shared with numerous other West Indian and South American palms, though apparently only one, the so-called *grigri* palm of Martinique, can be referred to the present genus with confidence.

Hill's statement that the coyure palm is taller than the royal palm does not apply to this species, but probably has reference to the llume palm (*Aeria attenuata*). Neither species is common nor much used. Aeria was pointed out to us from the distance as "coyure," but when close at hand all agreed that that name belongs to the present spiny species.

Cuscuta americana. DODDER. FIDEOS.

A slender parasitic vine, reported by Bello.

The large dodder of Porto Rico not only covers large masses of vegetation with its coarse yellow threads, but it sometimes invades and covers trees of considerable size.

Custard apple. See *Anona reticulata.*

Cycas revoluta.

Occasional in gardens, growing to large size in the open air.

Cynara scolymus. ARTICHOKE. ALCACHOFA.

A few specimens of the genuine European artichoke were seen near Santurce, apparently escaped from cultivation.

Cynodon dactylon. See *Capriola dactylon.*

Cynometra portoricensis.

Family Cassiaceae; a leguminous tree, 15 meters in height, recently described from the vicinity of Rincon. (Urban, Symb. **1:** 312.)

Cyphomandra betacea. TREE TOMATO.

A plant related to the tomato and at first placed in the genus Solanum. It grows rapidly to a height of 10 or 12 feet (3 to 4 meters), becoming a veritable shrub or small tree. The heart-shaped flowers are sometimes a foot in length. The fruits are borne in clusters, and are oval in shape, or somewhat pointed; the color is purplish or reddish, and the taste is similar to that of the ordinary tomato, though some have reported a gooseberry flavor in the ripe, raw fruit, and if stewed after the skin and seeds have been removed a resemblance to apricot is said to be developed. It has become very popular for tarts and pastries; also for jellies and preserves. The suggestion which is considered under the eggplant of grafting on *Solanum mammosum* might also find application in the present instance.

Cyphomandra is a native of the Andes of Peru and neighboring regions of tropical America, but has been successfully introduced into Jamaica, Ceylon, and other mountainous regions of the Tropics, and at many places is considered a valuable addition to the list of garden vegetables. It would in all probability thrive in Porto Rico, and as it can be propagated readily from seed its introduction offers no special difficulties.

Cypress vine. See *Quamoclit quamoclit.*

Cyrilla antillana. CIRILA.

Family Cyrillaceae; a tree found on the south coast. From the vicinity of Utuado and at Santa Ysabel. (Stahl, **6:** 34.)

Dacryodes excelsa.

A tree of the family Burseraceae; reported from near Maricao.

Dacryodes hexandra. TABONUCO. PLATE XXXIV.

A tree exuding a resin used for torches; found in mountain districts. Grisebach gives it as 10 to 15 feet high; Stahl as 75 feet high. The trunks are used for lumber. (Stahl, **4:** 53.)

Near Isolina there still exists a considerable area of virgin forest composed largely of what was taken to be this species. The trees are much higher than even the figures given by Stahl, with very smooth, straight, white trunks, often scarred near the base where they have been cut to secure the resin. The wood has a beautiful color and is said to be free from the attacks of insects.

Dalbergia ecastaphyllum. MARAY-MARAY.

A leguminous shrub, 3 to 4 meters high, found in thickets along the coast.

Dalbergia monetaria. PALO DE BRASILETE.

The red wood is said to furnish a resin resembling dragon's blood. Known from Utuado as *Hecastaphyllum monetaria.* (Stahl, **3:** 97.)

Dalechampia scandens.

Family Euphorbiaceae; a twining shrub; from Guanica.

Dama de noche. See *Cestrum nocturnum* and *Murraya exotica.*

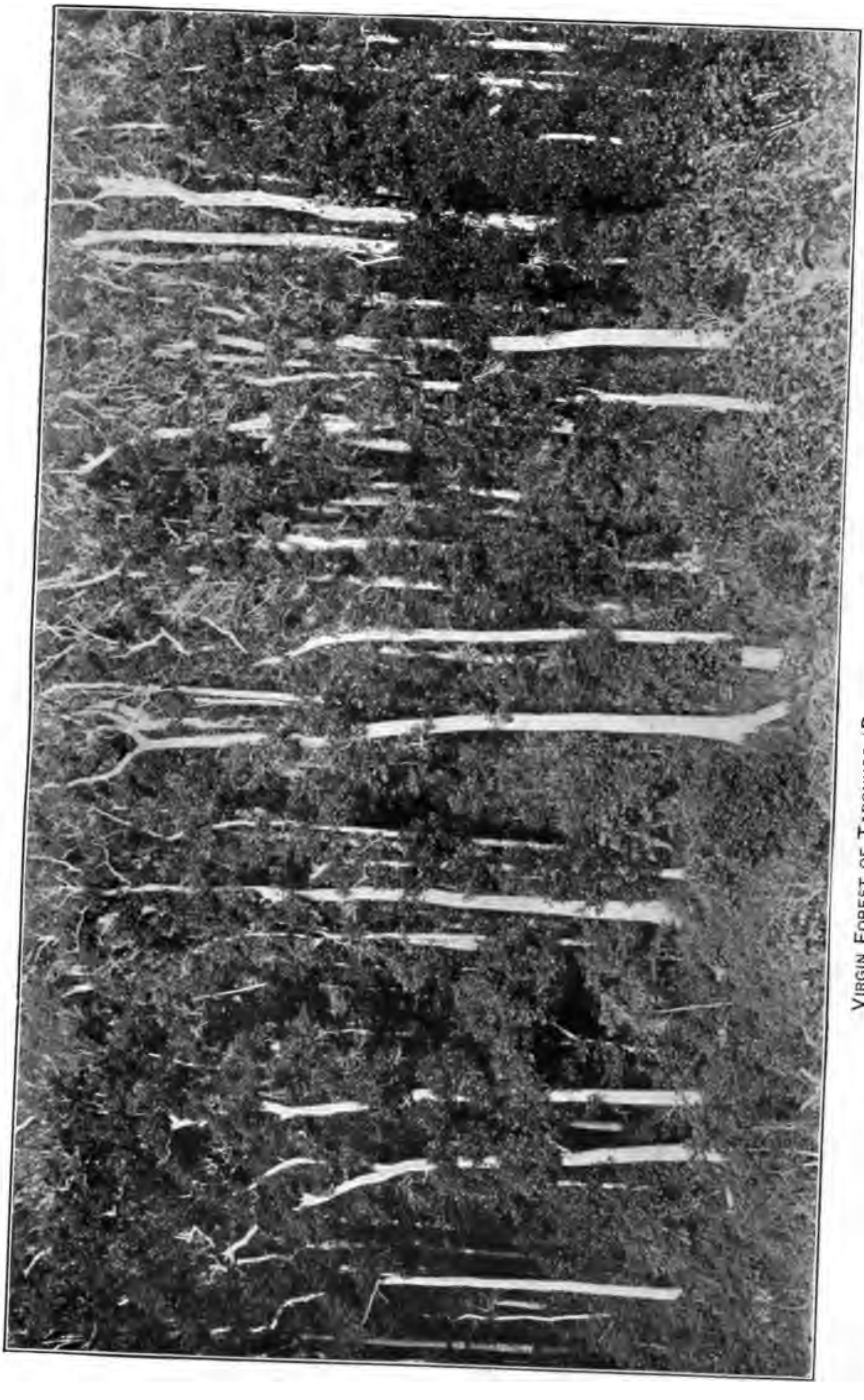
Dama juana.

Captain Hansard gives the specific gravity of 0.82 for the wood of this species.

Daphnopsis caribaea.

Family Thymelaeaceae; a tree 20 to 30 feet (6 to 9 meters) high; known from Cayey.

PLATE XXXIV.



VIRGIN FOREST OF TABONUCO (DACRYODES HEXANDRA). AT ISOLINA.

Daphnopsis philippiana. CIENEGUILLO.

Also called "emajagua" and "emajagua brava." A shrub or small tree of the family Thymelaeaceae, evidently generally distributed in forest districts, being reported from Luquillo, Naguabo, Juncos, Aibonito, Barranquitas, Penuelas, Utuado, and Jayuya.

Date. See *Phoenix dactylifera.*

Date palm. See *Phoenix dactylifera.*

Date plum. See *Diospyros tetrasperma.*

Another species, *Diospyros ebenaster*, is known from Porto Rico.

Datil. See *Phoenix dactylifera.*

Datura fastuosa. ESTRAMONIO.

Family Solanaceae; an herbaceous annual, 1 meter high. The seeds are said to possess poisonous properties. (Stahl, **6**: 119.)

Datura metel. CHAMICO BLANCO.

An herbaceous annual weed, 1 meter high, frequenting rocky places along the coast. (Stahl, **6**: 117.)

Datura stramonium. JIMSON WEED. ESTRAMONIO.

Also called "peo de fraile," "chamico morado," "chamisco," and "thorn apple." A solanaceous herb 3 to 4 feet (1 to 1.3 meters) high. The seeds are poisonous and are said to have medicinal value as a narcotic. (Stahl, **6**: 115, 118.)

Datura suaveolens. CAMPANA DE PARIS.

A shrub 3 to 4 meters high, found along river banks. (Stahl, **6**: 120.)

Datura tatula. See *Datura stramonium.*

Demajagua.

This name is probably intended for emajagua; at least that is its use in Cuba and South America.

Demajagua blanca.

A tree from all parts of the island; height, 10 to 12 feet (3 to 4 meters); diameter, 6 to 8 inches (15 to 20 centimeters). Wood white, soft; specific gravity .696; bark used for making ropes. (Exp. 1857.)

Demajagua colorado.

A tree from all parts of the island; height, 10 to 12 feet (3 to 4 meters); diameter, 6 to 8 inches (15 to 20 centimeters). Wood white, soft; specific gravity .698; bark used for making ropes. (Exp. 1857.)

Dendropremon bicolor. PARASITA.

Also called "hicaquillo del combron." A parasitic shrub of the family Loranthaceae. It is recorded as growing upon the orange and the custard apple.

Dendropremon caribaeus. HICAQUILLO. CAPITANA.

A parasitic shrub, attacking numerous trees, both wild and cultivated.

Desmanthus plenus. See *Neptunia plena.*

Desmanthus virgatus. DESMANTO RAYADO.

Family Mimosaceae; a woody herb 4 to 6 feet (1.3 to 2 meters) high, sometimes decumbent; found along the coast at Fajardo. (Stahl, **3**: 140.)

Desmanto amarillo. See *Neptunia plena.*

Desmanto rayado. See *Desmanthus virgatus.*

Desmodium. See *Meibomia.*

Dianthera pectoralis. CURIA.

Family Acanthaceae: an herbaceous plant 40 centimeters high; cultivated in gardens, and wild in dry places. A sirup made from this plant is said to be beneficial for pulmonary disorders. Called also "justicia balsam" in Jamaica. (Stahl, **6**: 248.)

Didymopanax micans. YAGRUME.

An indigenous araliaceous tree known from the vicinity of Adjuntas, Cabo Rojo, and Aguada. (Urban, Symb. **1:** 204.)

Didymopanax morototoni. YAGRUME.

Variously called "grayume" or "grayumo," "yagrume" or "yagrumo," "yagrume macho," and "pana cimarrona." A tree of 5 to 20 meters, probably the more common and widely distributed species in Porto Rico. "Yagrumo macho" or "male yagrumo" alludes to the fact that this tree is believed to be the male of Cecropia, which is called "yagrumo hembra."

Diffenbachia seguine.

Family Araceae; a very succulent aroid from swampy meadows near Juncos. It grows from 3 to 6 feet (1 to 2 meters) high.

Diego de noche.

In Cuba *Allionia incarnata.*

Dioclea reflexa. MATO.

Also called "bejuco de mato." A leguminous vine climbing to the tops of the highest trees. Reported from Maunabo, Yabucoa, and Luquillo. (Urban, Symb. **1:** 473.)

Diodia maritima.

A rubiaceous herb. (Stahl, **5:** 159, as *Diodia radicans.*)

Diodia radicans. See *Diodia maritima.*

Diodia rigida. *Diodia rigida.*

Family Rubiaceae: an herbaceous annual; frequents dry clay soil; 20 to 30 centimeters high. (Stahl, **5:** 84.)

Diodia sarmentosa. *Diodia sarmentosa.*

A woody herb growing among shrubs in arid soil; 1 meter high; from Maricao. (Stahl, **5:** 86.)

Diodia scandens. DIODIA TREPADORA.

A woody herb, 1 meter high, found in dry soil. (Stahl, **5:** 85.)

Diodia trepadora. See *Diodia scandens.*

Dioscorea. YAM. ÑAME.

The true yams of the Tropics belong to a distinct botanical family, the Dioscoreaceae, related to the Smilax family and the Lily family, but having no affinity to the sweet potato, to some varieties of which the name is commonly applied in the South. Nearly all of the very numerous species form more or less thickened roots, and many of them have been introduced into cultivation, mostly in the Tropics. Some years since the Chinese yam, *Dioscorea batatas*, which is hardy in temperate climates, was advocated for general culture in Europe and the United States, but its habit of forming its tuberous roots 3 feet in the ground rendered it very difficult to handle by ordinary methods of agriculture. The tropical species have the same tendency, but usually not to so pronounced a degree, and in most tropical countries the yam is a more or less important article of diet. In some it is merely accessory to cassava, while in others it takes first place as a root crop. It seems certain that in Porto Rico they have received no such careful attention as in the British West Indies, and the following abridgment of a report on "Yams in the West Indies," recently furnished by Mr. David G. Fairchild, Agricultural Explorer of the Section of Seed and Plant Introduction, United States Department of Agriculture, will probably be of use to those interested in agriculture in Porto Rico.

It is important, of course, to plant the best sorts, but with so many species and varieties in cultivation it is difficult to tell the different forms apart or to know which is most desirable. At the Trinidad Botanic Gardens a series of experiments have been conducted, on which a report has been made during the past year, and as this supplements the information furnished by Mr. Fairchild, and represents what is now known about the subject in that island, it seems best to include it here:

> The experiments in connection with this class of plants have been continued at St. Clair, and the improvement of the quality of the tubers grown in the new ground is so marked as to be patent to the veriest novice.
>
> The kinds grown were as follows:
>
> | | |
> |---|---|
> | Yellow yam | *Dioscorea cayenensis.* |
> | White yam | *Dioscorea alata.* |
> | Negro yam | *Dioscorea alata*, var. |
> | Red yam | *Dioscorea alata*, var. |
> | Horn yam | *Dioscorea alata*, var. |
> | Water yam | *Dioscorea alata*, var. |
> | Chinese yam | *Dioscorea batatas.* |
> | Afoo yam | *Dioscorea lutea.* |
> | Cush-cush, or Indian yam | *Dioscorea trifida.* |
>
> *Dioscorea bulbifera* is so evidently inferior that its culture has not been continued. The "devil yam," which was taken to be a very coarse variety of *D. alata*, has also been discarded as useless. The "negro yam" is by far the best of the white yams grown. The "yellow yam" is also a good table kind, very sweet and wholesome and much liked by American and European visitors.
>
> The "cush-cush," or "Indian yam," also known as "yampee," gives but very small tubers, and there are three or more varieties—red cush-cush, white cush-cush, and Demerara cush-cush. The last-mentioned kind has larger tubers than the others, testiculate in form, and generally of excellent quality. It has been found that the return made by varieties of this species is much less than from any other, but it is probably superior to any for the table of the better classes, although it would not be profitable to grow where a cheap supply of food stuff was required.
>
> The "Chinese yam," as I know it, is one of the best. Well grown and well ripened, it is of fine quality for table, and probably comes nearer in flavor to a good potato than any other variety. The "afoo yam" is the most inferior of all. This name, however, is sometimes applied to the "yellow yam," so that one may get the worst as well as the best yams under the same name, so little is local nomenclature to be trusted.
>
> The yield of yams given in former reports has been more than maintained. White yam gave over 20 pounds weight to a plant; Negro yam, 17 pounds; Chinese yam, 19 pounds; yellow yam, 12 pounds; and cush-cush, 7 pounds. Yams grown from aerial tubers, i. e., tubers which develop on the vines, gave 19 pounds per root. White yam yielded at the rate of 13 tons to an acre. If 25 per cent is deducted from this for waste and for planting again, there is still a crop of 10 tons per acre to be registered as the crop for the year of 1898.

The importance of similar and more extended experiments in Porto Rico is obvious, both for the sake of stimulating progress in the direction of mixed farming and greater local production of food stuffs, and because it is probable that among so many botanical species of different origins special adaptations to soils and climates will be found to exist, a knowledge of which will be of the utmost practical importance in utilizing these valuable food plants. The excellence of the crop will also determine the possibility of opening a trade with the United States, as suggested by Mr. Fairchild. It has been found that properly packed yams may be shipped from the West Indies to New York and interior points and arrive in good condition.

Dioscorea alata.

This species seems to be one of the commonest in Porto Rico, and may be recognized by noting that the vine has thin ridges or wings on the stem.

In Jamaica this species is said to be particularly useful on account of the fact that it bears well on shallow or marly soils, while other kinds require deep mold; it is also thought to keep better than the other species.

Dioscorea chondrocarpa.

A wild yam, growing in forests near Yabucoa. (Sintenis.)

Dioscorea multiflora.

Collected by Sintenis in the Sierra de Naguabo.

Dioscorea pilosiuscula.

Another wild species from forests in the Sierra de Naguabo.

Diospyros ebenaster. GUAYABOTA.

Family Ebenaceae; a native forest tree reported by Stahl (**6**: 284) from Toa Alta; identified by Urban (Add. **1**: 43).

Dipholis montana. VARITAL. TABLONCILLO.

Family Sapotaceae; a tree 5 to 6 meters high in mountain woods. (Stahl, **6**: 55).

Dipholis nigra. BUMELIA NIGRA. AUSUBO.

A large tree, 15 to 20 meters high, found in all mountain woods. The hard, red wood is considered one of the best of the numerous kinds produced in the island, and is used for a large variety of purposes. (Stahl, **6**: 56.)

Dipholis salicifolia.

A large, fragrant tree, growing in dry calcareous soil; reported from near Guanica.

Diplochita fothergilla. See *Tamonea fothergilla.*

Distictis lactiflora. VIUDA.

Family Bignoniaceae: a tendril-bearing vine with the reticulate veins of the leaves very prominent. Our specimen (no. 694) was obtained near Coamo. The flowers are white, with the base of the corolla canary-yellow.

Distreptus spicatus. See *Elephantopus spicatus.*

Divi-divi. See *Caesalpinia coriaria.*

A species also treated by some botanists as *Lebidibia coriaria.*

Dodonaea viscosa. CHAMISO.

Family Sapindaceae; a tree 3 to 4 meters high, found along the coast. (Stahl, **2**: 161.)

Dolicholus minimus. FRIJOLILLO PEQUEÑO.

Family Viciaceae; a reddish pubescent vine found in all parts of the island, flowering nearly all the year, especially in winter; appears to be common to tropical countries generally. (Stahl, **3**: 52, as *Rhynchosia minima.*)

Dolicholus phaseoloides. FRIJOLILLO COLORADO.

A vine seen only once in fruit by Stahl in the high hills of Bayamon. An indigenous species with short pods and broad, closely veined leaves. Found also in the other Antilles, Panama, Brazil, and the Galapagos Islands. (Stahl, **3**: 53, as *Rhynchosia phaseoloides.*)

Dolichos lablab. FRIJOLES CABALLEROS.

Family Viciaceae; a woody biennial cultivated in gardens for its edible beans. (Stahl, **3**: 74.)

Dolichos monachalis. See *Vigna catjang.*

Dominicos.

A variety of banana, mentioned by Hill.

Doncella. See *Byrsonima spicata.*

A tree from all parts of the island; height, 35 to 40 feet (11 or 12 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood pink, hard; specific gravity, 1.117; used in building houses. (Exp. 1857.)

Down tree. See *Ochroma lagopus.*

Drepanocarpus lunatus. PALO DE HOZ.

A leguminous tree, 3 to 5 meters high; found in borders of swamps near the sea. (Stahl, **3**: 94.)

Drymaria cordata. YERBA DE ESTRELLA.

Family Caryophyllaceae; an herbaceous reclining annual, 15 centimeters high, frequenting moist, shady places. (Stahl, **2**: 56.)

Drypetes alba. CAFFEILLO.

Family Euphorbiaceae. A native tree reaching a height of 40 feet (12 meters); reported from mountain forests, Sierra de Luquillo, and also between Adjuntas and Ponce. (Urban, Add. **1**: 71.)

Drypetes glauca. VARITAL.

Also called "caffeillo" and "palo blanco." A euphorbiaceous shrub generally distributed in the native forests; Luquillo, Yabucoa, Pennelas, Adjuntas, Jayuya, Maricao. *Drypetes lateriflora* is known from Bayamon. (Urban, Add. **1**: 73.)

Drypetes ilicifolia. ENCINILLO.

An indigenous shrub, 10 to 15 feet (3 to 4.5 meters) high, found by Stahl (**4**: 37) on the calcareous rocky hills along the north coast, between Cangregos and Loiza, and supposed to be a species of Ilex; secured by Gundlach at Arecibo. (Urban, Add. **1**: 68.)

Duranta plumieri. LLUVIA.

Family Verbenaceae, a shrub 6 to 15 feet (2 to 4.5 meters) high; in moist, sunny places, also cultivated in gardens; collected at Manuabo. According to Bello this is also called "azote-caballo" and "lila." (Stahl, **6**: 212.)

Earth nut. See *Arachis hypogea.*

Ecastaphyllum brownei. See *Dalbergia ecastaphyllum.*

Ecastaphyllum monetaria. See *Dalbergia monetaria.*

Echites circinalis. BABEIRO.

Family Apocynaceae. (Stahl, **6**: 79.)

Echites andrewsii. BABEIRO AMARILLO.

A woody climber, 3 to 4 meters high, reported from Manati. (Stahl, **6**: 82, as *E. neriandra.*)

Echites paludosa.

An apocynaceous vine, native in several of the Bahamas, Cuba, Haiti, Jamaica, and Panama. According to Grisebach's Flora (p. 406) this species is a source of rubber in Jamaica.

Echites umbellata. BABEIRO.

A woody herb, 3 to 5 meters high, occurring in shady waste places. (Stahl, **6**: 79.)

Eclipta alba. See *Eclipta erecta.*

Eclipta blanca. See *Eclipta erecta.*

Eclipta erecta.

Family Compositae. (Stahl, **5**: 132, as *Eclipta alba.*)

Eddoe. See *Colocasia esculenta.*

Eggplant. See *Solanum melongena.*

Egyptian privet. See *Lawsonia inermis.*

Ehretia bourreria.

Family Boraginaceae; a branching tree, 8 to 14 feet (2.5 to 4.5 meters) high; it bears small edible berries, and in Jamaica is called "currant tree." Known from Yabucoa.

Elaeis guineensis. AFRICAN OIL PALM.

The African oil palm, *Elaeis guineensis*, furnishes the chief article of export and is the principal basis of the commerce of West Africa. Two products are exported—the oil, derived from the reddish exterior of the pulp of the fruit, and the kernel, secured by cracking the inclosed nut after the pulp has been removed. The fruit is egg-shaped, and from 1 to 1½ inches (25 to 37 millimeters) in length. The deep red skin is thin, like that of the date. The oily pulp underneath is interspersed with tough fibers, but has a pleasant taste, and is frequently eaten after being slightly roasted. The oil is obtained in quantities by beating the nuts in wooden mortars and then skimming off from boiling water, also by less desirable methods in which the nuts are rotted. This is said to increase the yield of oil, but gives it a rancid taste unpleasant to the civilized palate, but not injuring the oil for export. In Europe the kernels are used for the extraction, under pressure, of another oil quite similar to that of the cocoanut and used for like purposes.

Elaeodendron attenuatum. COCORRONCITO.

Family Celastraceae; a low tree or shrub, 2 meters high, found along the seacoast. (Stahl, 4: 20.)

Elaeodendron xylocarpum. COCORRON.

A low tree or shrub, 2 to 3 meters high, found along the seacoast; from Guanica; a variety of this is reported from near Mayaguez. (Stahl, 4: 18.)

Elephantopus mollis. See *Elephantopus scaber.*

Elephantopus scaber. LENGUA DE VACA.

An herbaceous composite weed, 1 to 3 feet (30 to 90 centimeters) high; reputed to have medicinal value in Jamaica and the French islands. (Stahl, 5: 105.)

Elephantopus spicatus. YERBA DE BURRO.

A woody annual, 50 centimeters high; along roadsides and in dry pastures. (Stahl, 5: 106.)

Elephantopus tomentosus. COTORRILLO.

Specimens from Vega Baja (no. 1023).

Eleusine indica.

An annual, low, spreading grass; collected at Fajardo.

Eleutheranthera ovata. OGIERA.

An herbaceous annual, 50 centimeters high, found in sandy, stony places, (Stahl, 5: 126.)

Elm, Spanish. See *Cordia gerascanthoides.*

Emajagua. See *Paritium tiliaceum.*

Emajagua brava. See *Daphnopsis philippiana.*

Emajagua de sierra. See *Daphnopsis philippiana.*

Emajagua excelsa. See *Hibiscus elatus.*

Emilia sonchifolia. EMILIA.

An herbaceous composite annual; found along roads and in dry pastures. (Stahl, 5: 151.)

Encinillo. See *Drypetes ilicifolia.*

Enernaseada.

A tree from all parts of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood yellow, hard; specific gravity 0.783; fruit tree. (Exp. 1857.)

Enredadera. See *Barbieria polyphylla.*

Enrubio.

A wild tree, not common, reaching a height of 25 or 30 feet (7 to 9 meters), with a trunk 10 inches (25 centimeters) in diameter. Its wood is very hard, with a red heart and white sapwood. Has no application (Grosourdy, 2: 382). Specific gravity 0.988 (Exp. 1857). Grosourdy refers this to *Zanthoxylum lanceolatum*, a species given in Index Kewensis as a synonym of *Z. clava-herculis*, which has since been referred to *Fagara martinicensis.*

Entada polyphylla.

Family Mimosaceae; a perennial vine; from Fajardo.

Erechtites hieracifolia. ACHICORIA DE CABRA (GOAT'S CHICORY).

An herbaceous erect annual composite, 50 centimeters high; grows in pastures. (Stahl, **5**: 150.)

Erigeron bellioides. BELLORITA.

An herbaceous annual composite, 12 centimeters high; found in stony moist places. (Stahl, **5**: 119.)

Erigeron canadensis. PASCUETA.

An herbaceous erect annual, 50 centimeters high; grows in pastures. (Stahl **5**: 158.)

Erigeron rivularis. PASCUETA AMARILLA.

Described as *E. canadensis*, for which it was at first mistaken. (Stahl, **5**: 121.)

Erigeron spathulatus. CHIRIVITA.

An herbaceous annual, 30 centimeters high; found in dry pastures. (Stahl **5**: 120.)

Eriobotrya japonica. LOQUAT. NÍSPERO.

"The loquat is planted along the roadsides on many of the estates in the Wynaad and elsewhere, and coffee appears to thrive well under it; but, so far as I am aware, the wood is not of any value, which at once places it at a disadvantage in competing with the jack. The loquat yields a pleasant fruit, in size and appearance much like the yellow plum."—Hull.

Eriodendron anfractuosum. See *Ceiba pentandra.*

Erithalis fruticosa. IAYAJABICO.

Family Rubiaceae; a shrub 3 to 4 meters high, found on the beaches and cliffs near the sea. (Stahl, **5**: 61.)

Ernodea de playa. See *Ernodea litoralis.*

Ernodea litoralis. ERNODEA DE PLAYA.

A decumbent rubiaceous shrub; from Cabo Rojo. (Stahl, **5**: 83.)

Eryngium foetidum. CULANTRO DEL MONTE.

An ill-smelling umbelliferous herb, 1 foot (30 centimeters) in height, found near cultivated places. "Fit weed," as this plant is called in Jamaica, is reputed to have curative value in cases of snake bite, epileptic fits, etc. Specimens were collected along the military road beyond Rio Piedras; used in that locality for seasoning food. (Stahl, **4**: 196.)

Erythrina corallodendron. PIÑON ESPINOSO.

A leguminous tree or shrub, 5 meters high, growing on limestone hills. Used for hedges in Jamaica, where it is called the "red bean tree." (Stahl, **3**: 89.)

Erythrina glauca. BUCAGO.

A leguminous tree, 10 meters high, found near rivers. (Stahl, **3**: 88.)

Erythrina micropteryx. BUCARE.

Also known as "palo de boyo." A leguminous tree of 15 to 20 meters beset with short, conical spines; flowers red. Cultivated as a shade tree for coffee and reported from numerous localities in Porto Rico. It is a native of the lower Andes of Peru. (Urban, Symb. **1**: 327.)

Erythrina umbrosa. BUCARE. MADRE DE CACAO.

Also called "bois immortelle" and "madre de cacao" in South America. Captain Hansard claims to have introduced seed of this species from Trinidad, but considered the seedlings the same as the tree already common in Porto Rico and now supposed to be *E. micropteryx*. This species is said to be the most popular shade tree for the cacao plantations of the mainland, and is reported by

Hill and Stahl (?) as a coffee shade tree in Porto Rico. According to Urban, the true *E. umbrosa* is not yet known from any of the West Indies, such references pertaining to *E. micropteryx*. (Urban, Symb. **1**: 327.)

Erythroxylon brevipes. JIBA.

Family Erythroxylaceae; a shrub, 2 to 3 meters high, found in sandy places near the sea. Urban reports the form *intermedia* from Fajardo. (Stahl, **2**: 136.)

Erythroxylon havanense. See *Erythroxylon ovatum.*

Erythroxylon obovatum. JIBA.

A shrubby tree, 12 feet (4 meters) high, on limestone hills near the sea at Veja-baja and Aricebo. (Stahl, **2**: 138.)

Escambron. See *Pisonia aculeata.*

Escambron blanco. See *Clerodendron aculeatum.*

A simple-leaved spiny plant, collected about the large cacti near Guayanilla.

Escambron colorado.

A name applied to *Pithecolobium unguis-cati* at Guayanilla.

Escoba. See *Sida carpinifolia.*

Escoba acorazanada. See *Sida cordifolia.*

Escoba babosa. See *Bastardia bivalvis.*

Escoba blanca. See *Sida carpinifolia.*

Escoba colorada. See *Sida rhombifolia.*

At Cataño this name was also applied to a small species of Croton (no. 960).

Escoba de Jamaica. See *Sida jamaicensis.*

Escoba dulce. See *Sida ulmifolia.*

Escoba pestañosa. See *Sida ciliaris.*

Escoba purpurina. See *Sida purpurea.*

Escoba tendida. See *Sida supina.*

Escobillon. See *Pterocaulon virgatum.*

Escobita dulce. See *Sida ulmifolia.*

Escorzonera. See *Craniolaria annua* and *Martynia diandra.*

Espejuelo. See *Sarcomphalus reticulatus.*

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood yellow, very hard; specific gravity, 1.299; used for cabinetwork. (Exp. 1857.)

The strong yellow wood is used for shelves and fences. (Grosourdy, **2**: 382.)

Espejuelo amarillo.

A tree from the northeastern part of the island; height, 40 to 50 feet (12 to 15 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood yellow, very hard; specific gravity, 1.050; used for cabinetwork. (Exp. 1857.) (Grosourdy, **2**: 382.)

Espejuelo bobo.

A thick-barked tree, not of very large size; found occasionally in the hills; specific gravity, 1.08. (Hansard.)

Espiga de San Antonia. See *Buchnera elongata.*

Espinillo.

A tree from all parts of the island; height, 35 to 40 feet; diameter, 12 to 15 inches. Wood greenish, very hard; specific gravity, 1.114; used for cabinetwork. Also called "huso." (Exp. 1857.) (Grosourdy, **2**: 382.)

Captain Hansard gives this wood, which indicates that the tree occurs in the Luquillo region; specific gravity, 1.10. A spiny tree, similar to *Randia aculeata*, bears this name in the vicinity of Vega Baja, but our specimen (no. 1028) is stirile and has not been identified.

Espino. See *Fagara martinicensis* and *F. monophylla*, *Zanthoxylum clava-herculis*, *Z. acuminatum* and *Z. caribaeum.*

According to Captain Hansard, this tree has a specific gravity of 7.69. He also calls it the "box thorn." The wood is light yellowish. The trunk has large, conical spines, bark turning from gray to white. This suggests the possibility that *Hura crepitans*, generally called "avilla," may be intended.

Espino amarillo.

A tree from all parts of the island; height, 45 to 50 feet (14 to 15 meters); diameter, 15 to 20 inches. Wood yellow, soft; specific gravity, 0.556; used for lumber. (Exp. 1857.)

Grosourdy (**2:** 382) refers this to the genus Zanthoxylon.

Espino blanco.

A tree from all parts of the island; height, 45 to 50 feet (14 to 15 meters); diameter, 15 to 20 inches (37 to 45 centimeters). Wood white, soft; specific gravity, 0.642; used for lumber. (Exp. 1857.)

Grosourdy (**2:** 382) also refers this to the genus Zanthoxylon, and suggests that it may be identical with the "agua blanca" of Cuba.

Espino rubial. See *Fagara caribaea*, *F. martinicensis*, *F. monophylla*, *F. pterota*, and *Z. ochroxylum.*

A tree from all parts of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood yellow, hard; specific gravity, 0.664; used for lumber. (Exp. 1857.)

Espino rubio.

Very scarce and not much used; specific gravity, 0.68, according to Captain Hansard.

Espinosa. See *Anthacanthus spinosus.*

Esponja. See *Luffa aegyptiaca.*

Espuela de galan. See *Scolosanthus grandiflorus.*

Estramonio. PEO DE FRAILE. See *Datura stramonium* and *D. fastuosa.*

Estrapajo. See *Luffa aegyptiaca.*

Eugenia aeruginea. GUASAVARA.

An indigenous myrtaceous tree sometimes 60 feet in height, known from Bayamon, Juncos, Yabucoa, Guanica, Mayaguez, and Arecibo. A related species of equal size, *E. eggersii*, is reported from several points between Luquillo and Penuelas. (Urban, Add. **2:** 141.)

Eugenia aromatica. PALO DE CLAVO.

A tree 25 feet (7 meters) in height, with a rather straight trunk 4 or 5 feet (120 to 150 centimeters) in diameter, that furnishes a wood of good weight and harder than the average; fibrous and compact with a fine grain. It is not used, and when dry has neither odor nor taste. Specific gravity, 0.897. (Grosourdy, **2:** 405.) The native name suggests that of the clove, *Caryophyllus aromaticus.*

Eugenia biflora ludibunda. PITANGUEIRA.

Also called "hoja menuda." A myrtaceous shrub or small tree, not reaching 20 feet in height. Indigenous in the thickets of the limestone hills near the coast. Reported from the vicinity of San Juan, Juncos, Fajardo, Manati, Morovis, and Dorado. The variety *lancea* comes from Fajardo and Camuy. (Urban, Add. **2:** 149.)

Eugenia buxifolia. HOJA MENUDA.

A myrtaceous shrub or small tree, extending from Florida to Cuba, Santo Domingo, Jamaica, and Porto Rico; known in Porto Rico from the vicinity of Guanica and Cabo Rojo. A similar but somewhat larger species, *E. axillaris*, is known from Bayamon and several localities in the western part of the island, but no common name is recorded. (Urban, Add. 2: 157.)

Eugenia caryophyllata. See *Caryophyllus aromaticus.*

Eugenia confusa. CIENEGUILLO.

A myrtaceous tree 60 feet (18 meters) in height from the Florida Keys, Bahamas, Jamaica, Virgin Islands, Antigua, Guadeloupe, and Dominica. In Porto Rico it is known only from near Maricao in the forests of Mount Alegrillo. *E. maricao*, 25 feet (7.5 meters), has a similar distribution, and is known from littoral woods near Ponce. (Urban, Add. 2: 161, 162.)

Eugenia cordata sintenisii. MURTA.

An indigenous myrtaceous shrub or small tree 30 feet (9 meters) high, reported from hillsides near Aibonito and Cayey.

Eugenia costata. See *Eugenia serrasuela.*

Cultivated in gardens at Yabucoa.

Eugenia flavo-virens. GUAYABILLO DE COSTA.

Family Myrtaceae; a shrub 2 meters high; grows on the coast. (Stahl, 4: 86.)

Eugenia floribunda. MURTA.

An indigenous myrtaceous tree attaining a height of 50 feet (15 meters). Reported from Cayey, Lares, and Quebradillas. A related species, *E. cordata*, also called murta, is represented in Porto Rico by a subspecies, *sintenisii*, a small tree of 30 feet (9 meters) reported from hillsides near Aibonito and Cayey. (Urban, Add. 2 : 173-175.)

Eugenia jambos. See *Jambosa jambos.*

Eugenia ligustrina. PALO DE MULTA.

Also known as "hoja menuda." A myrtaceous shrub or small tree, 18 feet (5 meters) high, distributed from the Bahamas to Trinidad; reported in Porto Rico from Fajardo, Coamo, Guanica, and Cabo Rojo, in woods along the shore and in river valleys.

Eugenia malaccensis. OTAHEITE APPLE.

The "Otaheite" or Malay apple has been introduced and become established in Jamaica and several other islands of the West Indies, but it is not known to exist in Porto Rico. The same may be said of *E. javanica*, the "Malacca apple," and *Syzygium jambolanum*, the Java or jack plum.

Eugenia monticola. BIRIJI.

Also called "hoja menuda." An indigenous myrtaceous shrub or small tree sometimes attaining 30 feet (9 meters). Apparently generally distributed in forests and thickets throughout the island, Bayamon, Juncos, Farjardo, Cayey, Coamo, Isabella, and Quebradillas. (Urban, Add. 2: 154.)

Eugenia poiretii. HOJA MENUDA.

Also called "biriji;" a shrub 3 to 4 meters high on sandy beaches; also reported from the vicinity of Boamo and from Juncos. (Stahl, 4: 79.)

Eugenia portoricensis. PETANGUEIRA.

Urban describes this species as a variey of *Eugenia pseudopsidium.* (Stahl, 4: 82.)

Eugenia procera. HOJA MENUDA.

A small indigenous tree of general distribution from Cuba to Barbados. Known in Porto Rico from the vicinity of Maunabo. (Urban, Add. 2: 163.)

Eugenia pseudopsidium portoricensis. QUIEBRA HACHA.

A small myrtaceous tree, under 25 feet (7.5 meters) in height. Indigenous in numerous localities, Bayamon, Yabucoa, Aibonito, Coamo, Mayaguez, Aguada, Lares, Quebradilla, and Manati. (Urban, Add. 2: 164.) Variety *genuina* of this species is not known from Porto Rico, and the Porto Rican form is admitted by Urban to be easily distinguished by several characters, there seems little warrant for setting aside De Candolle's species, *E. portoricensis*. According to Stahl, *E. pseudopsidium* is called "guayabillo" and is a tree or shrub 3 to 4 meters high, found rarely in mountains and waste places. (Stahl, **4**: 84.)

Eugenia sintenisii Kr. & Urb.

A striking species, with nearly round, heavily veined leaves. (Urban. Add. **2**: 168.)

Eugenia serrasuela. SERRASUELA.

An indigenous myrtaceous tree of doubtful specific identity. Reported by Bello only from the vicinity of Anones as *Eugenia costata*. (Urban. Add. **2**: 170.)

Eugenia stahlii.

Called "guayabota" and "limoncillo." A tree 60 feet (18 meters) in height, indigenous and peculiar to Porto Rico, Luquillo, Adjuntas, Penuelas. A smaller closely related species, *E. sintenisii*, is known only from El Yunque and from the Sierra de Naguabo. (Urban, **2**: 168.)

Eugenia tetrasperma. GUASABARA.

Tree or shrub 5 meters high; native in the forests. (Stahl, **4**: 80.)

Eupatorium dalea. GUERRERO.

A composite shrub 6 to 10 feet (2 to 3 meters) high; a rum made from the leaves and flowers is used in medicine. (Stahl, **5**: 114, as *Critonia dalea.*)

Eupatorium macrophyllum. TURMA TORO.

An erect, herbaceous annual, 1 meter high, frequenting mountain shades. (Stahl, **5**: 109.)

Eupatorium odoratum. SANTA MARIA.

A woody herb, 1 to 2 meters high, annual, found in waste places. (Stahl, **5**: 111.)

Eupatorium polyodon. SANTA MARIA.

A recently described shrub of 2 to 6 meters, from Bayamon, Cayey, Aibonito, Maricao, and Mayaguez. It is *Eupatorium triste* of Stahl, which was not the true species of De Candolle. (Urban, Symb. **1**: 462.)

Eupatorium portoricense. GUERRERO.

A shrub or tree, from 2 to 5 meters high. It grows in the mountains as well as in the thickets along the seashore, and has been introduced into cultivation. (Urban, Symb. **1**: 459.)

Eupatorium resinifluum. GUERRERO.

A shrubby species attaining only 1 or 2 meters; known from Adjuntas and Maricao. (Urban, Symb. **1**: 462.)

Eupatorium triste. See *Eupatorium polydon.*

Eupatorium villosum. OREGANILLO.

A shrub 1 to 4 meters high. The variety *dolicholepsis* is known from several localities in the north and northwestern parts of the island. (Urban, Symb. **1**: 462.)

Euphorbia.

A large genus of the Euphorbiaceae or spurge family, represented by numerous species in Porto Rico. These are mostly small herbs or low shrubs of no economic value.

Euphorbia buxifolia.

Family Euphorbiaceae; shrubby, 1 foot high (30 centimeters), frequenting the rocky seashore near Guinaca.

Euphorbia heterophylla. MARAVILLA.

Cultivated at Juana Diaz as an ornamental. The base of the upper leaves are light red, as in Poinsettia.

Euphorbia portoricensis.

A very small plant with subreniform pubescent leaves; recently named by Urban on specimens from near Cabo Rojo.

Euterpe.

A genus nearly related to that of the royal palm, Roystonea. An unnamed species is reported by Eggers as growing gregariously on El Yunque, at an altitude of 1,500 to 3,000 feet. This is doubtless the species known in the northeastern part of the island as "palma de la sierra," which is said to be very similar to the royal palm, if not indeed identical with *Roystonea oleracea*, the so-called "cabbage palm."

Exostemma caribaeum. CUERO DE SAPO.

A rubiaceous shrub. (Stahl, **5**: 48.)

Exostemma floribundum. See *Antirrhoea coriacea.*

Fagara.

A genus of Rutaceae, including many species of West Indian trees formerly referred to Zanthoxylum; several of these are indigenous in Porto Rico.

Fagara caribaea. ESPINO RUBIAL.

An indigenous shrub or tree, 7 to 20 meters high. Reported from the western part of the island, at Peñuelas, Sabana, Guanica, Cabo Rojo, Rincon, and Aguadilla. (Urban, Add. **3**: 251.)

Fagara flava. SATINWOOD.

Indigenous; 3 to 10 meters; known also from the Florida Keys and from several of the smaller Antilles. (Urban, Add. **3**: 258.)

Fagara martinicensis.

Also called "espino," "espino rubial," and "cenizo." An indigenous tree of 5 to 20 meters. Of general distribution from Cuba to Trinidad, and known from mountain forests in numerous localities in Porto Rico. The root is considered medicinal. (Urban, Add. **3**: 252.)

Furnishes a wood moderately hard, white in color, that breaks with a vertical fracture and is used in the construction of houses in the country. The bark contains a yellow dye. (Grosourdy, **2**: 375).

Fagara microphylla. See *Zanthoxylum tragodes.*

Fagara monophylla.

Variously named "carubio," "mapurito," "rubia," and "espino rubial." A tree of 2 to 10 meters, indigenous in forests and thickets in coast or foothill regions throughout the island. (Urban, Add. **3**: 256).

Fagara pterota. ESPINO RUBIAL.

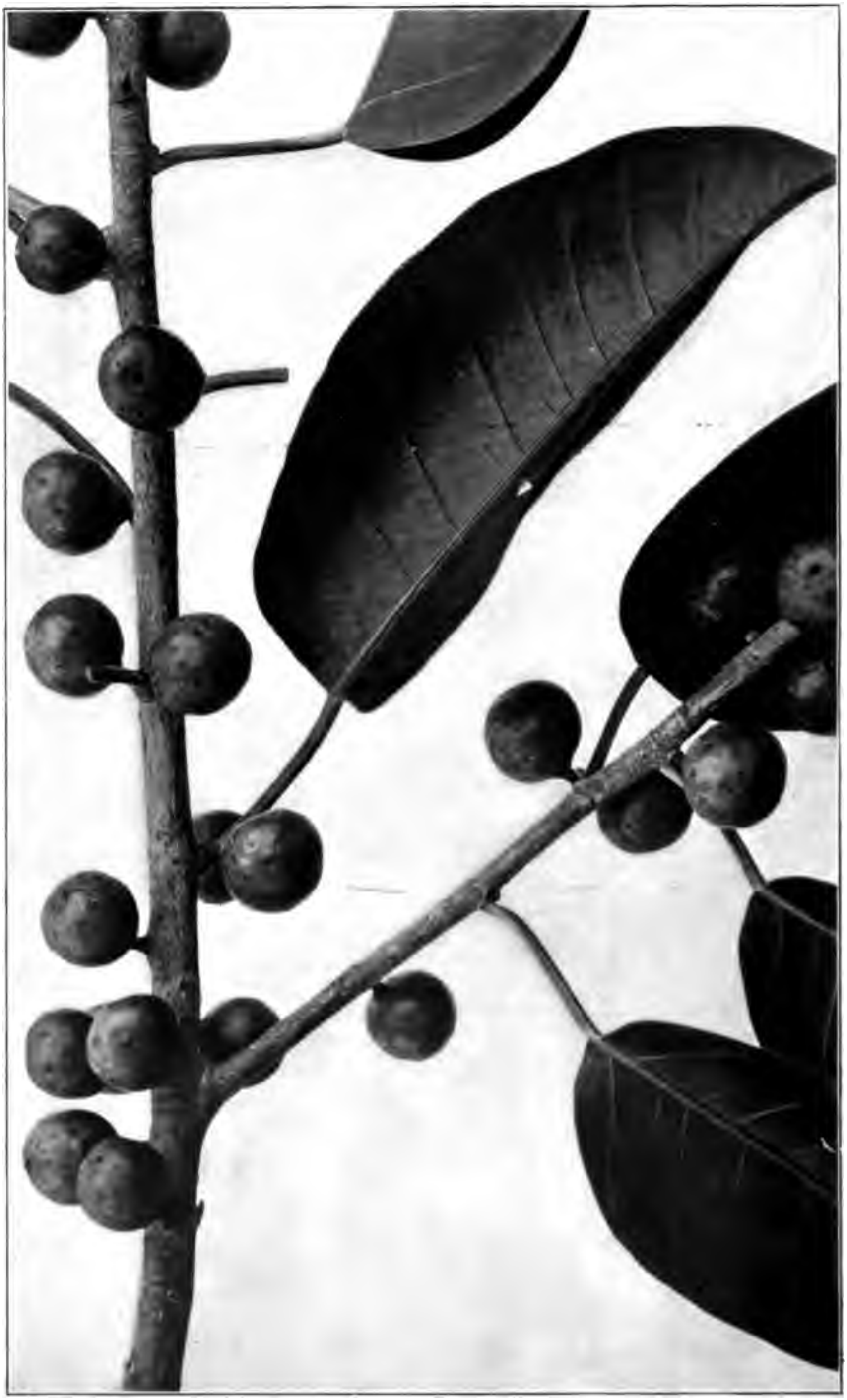
A wild tree, produced in abundance over nearly the entire island, 40 to 50 feet (12 to 15 meters) high and 12 inches (30 centimeters) in diameter. The wood is rather strong and solid, greenish-yellow or snuff-colored; used for doors, floors, windows, etc. The military authorities of San Juan used it for making chests. It is also used in ships' bulwarks. (Grosourdy, **2**: 382.)

Fagara spinifex. NIARAGATO.

A shrub or small tree of 1 to 5 meters. Reported from San Ildefonso, near Coamo; also from Guanica and the river Juey. (Urban, Add. **3**: 265).

Fagara trifoliata.

A shrub or small tree, 2 to 8 meters, known from the vicinity of Guanica. The distribution of the species extends southward to Trinidad. (Urban, Add. **3**: 272.)



JAQUEY (FICUS LENTIGINOSA). ROAD BETWEEN PONCE AND ADJUNTAS.

Falsa belladona. See *Solanum seaforthianum.*

Falso guaco. See *Willughbaeya scandens.*

Falso marrubio. See *Maesosphaerum polystachyum.*

Faramea odoratissima. PALO DE TORO.

Family Rubiaceae; a tree or shrub 3 meters high, found in mountains and waste places; flowers fragrant. The name "cafetillo" is recorded by Bello. (Stahl, 5: 66.)

Farolitos. See *Cardiospermum halicacabum.*

Fevillea cordifolia. SECUA.

Also called "pepita amarga," and in Jamaica "antidote cocoon" and "sabo." Family Cucurbitaceae, a woody biennial creeper. In Jamaica an oil has been extracted from the seeds and used in lamps. The seeds are also used as an antidote in poisoning and as a remedy for dropsy.

Ficus arbutifolia.

Family Moraceae; said to be cultivated along the roadside at Arroyo (Sintenis).

Along the entire road from Aguadilla to Arecibo two species of fig were common. This part of the country offers much waste land in addition to the roadsides, which might be planted in rubber or any similar crop.

Ficus carica. FIG. HIGO.

A few fig trees were seen near Santurce, but they were not in a thriving condition, and the probabilities of success on the moist north coast seem to be slight.

Ficus crassinervis.

Near Naguabo.

Ficus lentiginosa. JAGUEY. PLATE XXXV.

The fruits are light green, spotted with dull red, and are much larger than those of *F. pedunculata.* Both species are planted for shade along the road between Ponce and Adjuntas.

Ficus pedunculata.

According to Grisebach, this species is called "Jamaica cherry." It has been reported from south Florida and many of the West Indian islands, but was originally described from St. Christopher.

Ficus portoricensis.

A native fig tree attaining a height of 10 meters; from Yabucoa and Manati. (Urban, Symb. 1: 472.)

Fideos. See *Cuscuta americana.*

Fig. See *Ficus carica.*

Fit weed. See *Eryngium foetidum.*

Flamboyán. See *Poinciana regia.*

Flamboyant boanco. See *Bauhinia kappleri.*

Fleurya estuans. PICA-PICA.

A common weed about Santurce; belongs to the nettle family with stinging hairs.

Flor de agua. See *Castalia.*

Flor de muerto. See *Clerodendron fragrans.*

Forestiera segregata.

Family Oleaceae; a shrub or small tree; native in Florida and the northern Antilles, including Porto Rico.

Forsteronia corymbosa. BEJUCO DE SAN JUAN.

Reported by Bello.

Forsteronia floribunda.

Family Apocynaceae; a trailing shrub said to yield rubber.

Framboyant. See *Poinciana regia.*

A local mispronunciation of flamboyant.

Frangula sphaerocarpa.

Family Rhamnaceae; a shrub or small tree from near Lares. (Grisebach, 99.)

French Jasmine. See *Calotropis procera.*

Frijol cimarrón. See *Vigna capensis.*

Frijol marrullero. See *Vigna glabra.*

Frijoles. See *Vigna catjang.*

In Central America and Mexico this name is applied to the common black bean. *Phaseolus vulgaris.*

Frijoles caballeros. See *Dolichos lablab.*

Frijolillo. See *Dolicholus reticulatus.*

Frijolillo colorado. See *Dolicholus phaseoloides.*

Frijolillo de ñame. See *Pachyrrhizus angulatus.*

Frijolillo pequeño. See *Dolicholus minimus.*

Fruta de pan.

A tree from all parts of the island; height, 30 to 40 feet (9 to 12 meters); diameter, 15 to 20 inches (37 to 45 centimeters); wood white, very soft; specific gravity 0.36; not used. (Exp. 1857.)

Furcraea gigantea. MAURITIUS HEMP.

Family Amaryllidaceae. A large agave-like plant native in Mexico, but now generally known as Mauritius hemp from the fact that its culture was taken up on a large scale in Zanzibar. Fourcroya will grow on day sandy land where few other crops of value can be raised, but as in the case of sisal hemp there is little probability that it would be desirable to plant extensively in Porto Rico. The species is already introduced into the island and is occasionally planted as an ornamental instead of agave.

Fustic. See *Maclura tinctoria* and *Zanthoxylum.*

Gaita. See *Hypelate paniculata.*

A tree from the interior of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 16 to 18 inches (40 to 45 centimeters). Wood white, rather hard; specific gravity, 0.753; used for cabinet work. (Exp. 1857.)

Galactia.

A genus of leguminous creeping or twining vines. Stahl describes *Galactia berteriana* and *G. filiformis.* Sintenis collected the former near Bananquitas and the latter near Cabo Rojo. (Stahl, 3: 66–67.)

Galactia tomentosa.

A recently described species known from between Aibonito and Coamo. (Urban, Symb. 1: 472.)

Galan arbóreo. See *Acnistus arborescens.*

Galan del monte. See *Cestrum laurifolium.*

Gallina.

"Chicken wood." Much used for machete handles. A very hard, yellow wood. (Hansard.)

Gallito. See *Agati grandiflora.*

Gandul. See *Cajanus cajan.*

Gangolin. See *Ilex sideroxyloides portoricensis.*

Garcinia mangostana. MANGOSTEEN.

Various attempts have been made to introduce this noble fruit into the West Indies, and a tree supposed to be the largest in those islands has been growing for many years in the botanic gardens of Trinidad. It began to fruit in 1875 and has continued to do so at irregular intervals. Seedlings raised from it have proved, however, to be very weakly and have not reached maturity, a failure due, in the opinion of Superintendent Hart, to the lack of cross fertilization. Additional trees have recently been secured from the East in the hope of meeting this deficiency and making possible the more rapid multiplication of the species, for which the natural conditions are considered entirely favorable.

Mr. F. L. Cervantes, of Habana, has recently called our attention to the fact the former existence of the mangosteen in Cuba was reported by the French botanist Descourtilz. It was introduced from the East Indies by a wealthy French planter of Santiago de Cuba, reached maturity, and fruited, but is now believed to have become extinct. It is also reported that the mangosteen is grown in the Philippines, especially at Jolo, whence it is shipped in some quantity to Manila.

Garden egg.

A Jamaica name for the egg plant, *Solanum melongena.*

Gardenia florida. CAPE JASMINE.

Family Rubiaceae; introduced as an ornamental; reported from Yabucoa.

Garlic. See *Allium sativum.*

Garracho. See *Quararibea turbinata.*

Garrocho.

A tree from all parts of the island: height, 30 to 38 feet (9 to 12 meters); diameter, 6 to 8 inches (15 to 20 centimeters). Wood white, rather hard; specific gravity, 0.713; not used. (Exp. 1857.)

Gateado.

A tree from the interior of the island; height, 18 to 20 feet; diameter, 10 to 13 inches (25 to 32 centimeters). Wood striped red, hard; specific gravity, 1.164; used for cabinet work. (Exp. 1857.)

Grosourdy (2: 384) refers this wood to *Brosimum guianensis.* He gives the height as 20 to 30 feet (6 to 9 meters), and says that the samples from Porto Rico are red, striped with black, and would seem to be susceptible of a fine polish.

Gato. See *Helicteres jamaicensis.*

Gen gen.

Captain Hansard gives for this wood a specific gravity of 0.68. It has been used for making the wooden pans for gold seekers in the Luquillo mountains.

Gengibre. See *Zingiber officinale.*

Gengibre amargo.

The "bitter ginger" is probably *Zingiber zerumbet.* It has large coarse roots, and is used as an external remedy in the form of a tincture made with rum.

Gengibrillo.

Enumerated by Hill among the "trees" used for dyeing and tanning. In Ponce we found this name applied to small, fleshy rootstocks having a yellow, bitterish juice; possibly they may be those of some species of Curcuma. The juice is said to be used for dyeing and marking handkerchiefs. The dealers obtain their supplies from the hills, where the plant is believed to grow wild.

Genipa americana. JAGUA.

A rubiaceous forest tree native in South America and the West Indies. It should not be confused with the genip tree *Melicocca bijuga*, of family Sapindaceae, which is called "genipe" in Porto Rico. The fruit of genipa is from 4 to 6 inches (10 to 15 centimeters) in length and oval in shape. The skin is somewhat leathery in texture and of a russet color, irregularly mottled with grayish. The section shows it to be two-celled. The rind and the pulp, in which the seeds are embedded, are used in the preparation of one of the refreshing drinks which are such a feature in Porto Rico. The "jagua" is also occasionally eaten, but can scarcely be recommended. It has somewhat the flabby texture and much of the taste of dried apples; according to Schumann, it contains large quantities of tannic acid.

It reaches a height of 50 feet (15 meters), with a long, rather straight trunk, from 15 to 20 inches (37 to 45 centimeters) in diameter. It furnishes a rather soft, light wood that is, however, strong and resistant, flexible, and fibrous in texture. The color is uniformly whitish, tinged with a light reddish brown. It resembles the ash and possesses also its properties. It is very suitable for boxes and for any work where strength and elasticity are needed. The rims of sieves and shoe lasts are made of this wood. The military authorities of San Juan used it for ammunition chests and for hoops to barrels. Specific gravity, 0.873. (Grosourdy, **2**: 391.)

Geno. See *Lonchocarpus glaucifolius.*

Geno geno. See *Lonchocarpus violaceus.*

Captain Hansard says that the wood of this tree has a specific gravity of 0.89.

Geófila. See *Geophila reniformis.*

Geo geo.

A tree from all parts of the island; height, 25 to 40 feet (7 to 12 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood dark, soft; specific gravity, 0.511; not used. (Exp. 1857.)

Geophila reniformis. GEOFILA.

Family Rubiaceae; a creeping herb frequenting forest shades in moist places. (Stahl, **5**: 81.)

Gerardia domingensis. YERBA VERONICA.

Family Scrophulariaceae; an herbaceous annual in sandy inundated places. (Stahl, **6**: 233.)

Gesneria citrina.

Family Gesneriaceae; a new species from Utuado. (Urban, Symb. **1**: 477.)

Gesneria portoricensis. YERBA PARRERA.

Reported by Bello, who gives De Candolle as the author of the species, which does not, however, appear in the Index Kewensis.

Gia mansa. See *Casearia parvifolia.*

Gia verde. See *Casearia stipularis.*

Gilibertia arborea. VIBONA.

Also known as "pana," "palo cachumba," and "muñeca." A tree of 4 to 20 meters, belonging to the family Araliaceae. Reported from forests in numerous localities in Porto Rico. (Urban, Symb. **1**: 20; as *Sciadophyllum jacquini;* Stahl, **4**: 197.)

Gilibertia laurifolia.

Native names: "Palo de vaca," "palo de gangulin," "palo cachumba" and "vibona." A tree of 8 to 20 meters known from native forests near Aibonito, Jayuya, Barranquitas, Peñuelas, and Adjuntas. (Urban, Symb. **1**: 203.)

Ginger. See *Zingiber officinale.*

Ginoria rohrii.

Family Lythraceae; from Naguabo, Guayacan, and Guanica.

Glateado. See *Coccolobis laurifolia.*

Gnaphalium americanum. See *Gnaphalium purpureum.*

Gnaphalium purpureum. YERBA LANUDA.

An erect, herbaceous, annual composite on the borders of cane fields and in ditches; 25 centimeters high. (Stahl, **5**: 147.)

Goat weed. See *Capraria biflora.*

Gomatu palm. See *Arenga saccharifera.*

Gomidesia lindeniana. CIENEGUILLO.

An indigenous, myrtaceous shrub or small tree 30 feet (9 meters) high, reported from forests between Bayamon and Aguas Buenas; also from Aibonito, Barranquitas, Adjuntas, and Lares.

Gomphya nitida. See *Ouratea nitida.*

Gonfla lustrosa. See *Ouratea nitida.*

Gongolí.

A tree from all parts of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 10 to 12 inches. Specific gravity, 1.088. (Exp. 1857.)

Furnishes a strong, compact, flesh-colored wood that breaks with an oblique fracture. Its common use is for the framework of houses and for fences. (Grosourdy, **2**: 384.)

Gonolobus. See *Vincetoxicum.*

Gonzalagunia spicata. RABO DE RATON.

Family Rubiaceae; an erect or somewhat trailing woody annual or biennial, 1 meter high, common in fence rows and in waste places partially shaded. The white or slightly pinkish flowers are all turned to the upper side of the long curved raceme. The fruit is a whitish berry, but turns black on drying and appears capsular. (Stahl, **5**: 43, as *Gonzalea spicata.*)

Gonzalea spicata. See *Gonzalagunia spicata.*

Gossypium barbadense. COTTON. ALGODON.

Cotton is not raised in Porto Rico as a commercial crop, and indeed none is to be seen about the country except now and then a shrub in a dooryard.

The cotton plant is also one of many, of tropical origin, which have been selected and improved in subtropical or temperate regions and which tend to return to their original habits when taken back to the more humid tropics. The cottons of tropical countries, of which there are several species, are perennials, and scarcely begin to bear during a period sufficient for ripening a crop in the Southern States. There is, accordingly, little fear that any tropical country will successfully compete with warm temperate regions like Egypt and our Southern States, where the crop can be brought to early and even maturity so that the the necessary labor can be applied with advantage and economy.

The name "algodon rojo" (red cotton) is said to be the variety described botanically as *Gossypium purpurascens.*

Gossypium janiphaefolium. ALGODON DE YUCA.

A species of cotton described by Bello from the vicinity of Cabo Rojo, called "algodon de yuca" or "cassava cotton," on account of the similarity of the leaves to those of Manihot. Stahl reduces the species to *Gossypium herbaceum.* (Stahl, **2**: 96.)

Gossypium purpurascens. See *Gossypium barbadense.*

Gouania domingensis.

Family Rhamnaceae; a shrubby vine, growing also in Jamaica, where it is called "chaw stick" and used for toothbrushes, etc. It yields a valuable stomachic drug, according to Grisebach. A variety *aptera* is reported by Urban from Coamo and Aibonito.

Gouania tomentosa.

Reported from near Aguada.

Gout tea. See *Cordia globosa.*

Graciosa. See *Oldenlandia glomerata.*

Grana.

Given in Maza's Diccionario as the Porto Rican name of the royal palm, but apparently little used, "palma de yagua" being the prevalent designation.

Granada. See *Punica granatum.*

Granadilla. See *Passiflora quadrangularis.*

Granadilla tree.

In Jamaica and Cuba the names "granadilla tree" and "granadilla" are applied to *Brya ebenus*, a small leguminous tree yielding the so-called "American ebony." This species is not yet reported from Porto Rico. Captain Hansard describes the "granadilla tree" as very large, with small leaves and spreading branches. Nothing will grow underneath it, and it is therefore unwelcome in coffee plantations. The yellow wood is not considered of marketable value, although it will make fairly good boards. The specific gravity is 1.11. The "granadilla" fruit is from a vine *Passiflora quadrangularis*, and has nothing to do with the tree.

Granadillo.

A tree from all parts of the island; height, 40 to 45 feet (13 to 14 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood, yellow, hard; specific gravity, 0.917; used for cabinet work. (Exp. 1857.)

This is also enumerated by Hill among trees used for dyeing and tanning. See also the note under *Granadilla tree.*

Grape. See *Vitis vinifera.*

Grape fruit. See *Citrus decumana.*

Grape tree. See *Coccolobis.*

Grasilla. See *Utricularia subulata.*

Grayume. See *Didymopanax morototoni.*

Grayumo. See *Didymopanax morototoni.*

Captain Hansard states that this tree is supposed to have two distinct sexes, the female being hollow, while the male is solid and is sometimes sawed into white narrow boards, although he has seen some 14 inches wide. Owing to the softness and lightness of the wood, it is used only for inside work. The tree is large, with parasol-shaped leaves, and the name is sometimes erroneously pronounced "yaugrumo."

Ground cherry. See *Physalis.*

Ground nut. See *Arachis hypogaea.*

Guaba. See *Inga vera.*

A most useful tree for shade of coffee; according to Captain Hansard the specific gravity of the wood is 0.64.

Guabara.

The wood is given a specific gravity of 0.63 by Captain Hansard.

Guácima del Norte. See *Guazuma ulmifolia.*

Guácima del Sur. See *Guazuma tomentosa.*

Guaco. See *Willughbaeya odoratissima* and *W. cordifolia.*

Guaco de cabra. See *Willughbaeya porosa.*

Guajacum officinale. LIGNUM VITAE. GUAYACAN.

Family Zygophyllaceae; a tree 5 meters high, wood called "lignum vitae." The wood of this tree is very hard, cross-grained, and of high specific gravity. It takes a fine polish and is used in making rollers for casters and various utensils. The resin exuded from the stem called "guaiacum" is said to have the property of changing color when brought in contact with various substances, also used as a stimulant in medicine. (Stahl, **2**: 173.)

A wild tree met with on the coasts, reaching a height of 45 or 50 feet (14 or 15 meters), with a trunk 12 to 15 inches (30 to 37 centimeters) in diameter. It furnishes a very hard wood, very fine-grained and compact. The sapwood which is almost as hard as the heart is light yellow, while the heart is brown mixed with green with darker stripes. It is a valuable wood and its exportation forms a branch of commerce. It cuts well with the saw and in spite of its fibrous texture is much worked. It can also be split, especially when recently cut, at which time the wood is much softer and more easily worked. It becomes much harder on exposure to the atmosphere and is then very difficult to work.

It is used extensively for machinery and in cabinet work and for turned articles, and in all works where strength and hardness are needed, such as wooden cogs, mortars, hubs of wheels, etc. It is susceptible of a high polish. The green wood has a specific gravity of 1.080; the dry, 1.354 to 1.360. (Grosourdy, **2**: 389.)

It is believed in Porto Rico that coffee powdered with a mortar and pestle of "guayacan" is far superior to that ground in a wooden mill.

Guajacum sanctum. GUAYACANCILLO.

Family Zygophyllaceae; a tree said to have been abundant formerly on the coast hills of the south side of the island, but now nearly exterminated as far as large trees are concerned. The wood is considered valuable, and a resin or balsam exuded from it is medicinal. (Stahl, **2**: 174.)

According to Engler and Prantl the wood of this species is also utilized in commerce as lignum vitae.

Guajanilla amarilla.

A wild tree produced in abundance in the southern part of the island. Its height is about 40 feet (12 meters), and its trunk 12 to 15 inches (30 to 37 centimeters) in diameter. The wood is strong, dark yellow, breaking with a vertical fracture. Its most common use is for shelving in houses. (Grosourdy, **2**: 386.)

Guajanilla prieta.

Said to be a variety of guajanilla amarilla, distinguished only by having its dark yellow wood streaked with brown. (Grosourdy, **2**: 386.)

Guajanillo.

Captain Hansard gives the specific gravity as 0.80 and states that it is the same as "caracolillo."

Guajona.

A large tree occurring rarely in the mountains of the Luquillo region; the wood makes good boards. The name means gypsy. (Hansard.)

Gualteria americana. See *Waltheria indica.*

Guamá. See *Inga laurina.*

Specific gravity, 0.70 (Hansard). Used for firewood and as a coffee shade. The fruit is a broad, bean-like pod with edible, rather sweet-tasting, fluffy pulp. Abundant in foothills.

Guanábana.

Soursop. The fruit of *Anona muricata.*

Guanabancilla cimarrona. See *Vincetoxicum.*

Guanabanillo.

A tree from all parts of the island; height, 20 to 25 feet (6 to 7.5 meters); diamter, 10 to 12 inches. Wood light, soft; specific gravity, 0.728; not used. (Exp. 1857.)

Guanábano. See *Anona muricata.*

A tree from all parts of the island; height, 25 to 30 feet (7.5 to 9 meters); diameter, 12 to 15 inches. Wood, light, soft; specific gravity, 0.688; not used. (Exp. 1857.)

Captain Hansard gives this wood a specific gravity of 0.44.

Guanábano cimarron. See *Anona montana* and *A. palustris.*

Guanávano. See *Anona muricata.*

A less correct form of "guanábano."

Guanaguao.

A tree from all parts of the island; height, 60 to 70 feet (18 to 21 meters); diameter, 60 to 65 inches (150 to 160 centimeters). Wood flesh-colored, soft; specific gravity, 0.741; not used. (Exp. 1857.)

Guano. See *Ochroma lagopus.*— ?

Silk-cotton tree with long, fluffy pods sold in market; grows profusely in British islands.

A tree from all parts of the island; height, 25 to 30 feet (7.5 to 9 meters); diameter, 18 to 20 inches (45 to 50 centimeters). Wood, yellow very soft; specific gravity, 0.231; little used. (Exp. 1857.)

Guansa.

A tree from all parts of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood ash-colored, rather hard; specific gravity, 0.729; not used. (Exp. 1857.)

Guao. See *Comocladia.*

According to Engler this name is applied to *Comocladia ilicifolia*, an anacardiaceous tree, also known as "carrasco" in Porto Rico and other West Indian islands. Hill's reference (p. 34) is evidently an error for "guano," the popular name of *Ochroma lagopus*, the West Indian cork-wood tree, which furnishes a downy fiber.

Guara. See *Cupania americana.*

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood white, soft; specific gravity, 0.596; not used. (Exp. 1857.)

Captain Hansard gives a specific gravity of 0.70.

Guaraguadillo. See *Guarea humilis.*

Guaraguao. See *Guarea swartzii*, *G. trichilioides*, and *Trichilia spondiodes.*

A tree occasionally found, but not plentiful, in the mountains of the northeastern part of the island. The wood is red and makes good boards, similar to mahogany; specific gravity, 0.69 (Hansard).

Light reddish brown, streaked with lighter and darker shades. Large ducts numerous, occurring singly or in irregular loose groups of two to four. Medullary rays numerous, but very indistinct. An exceedingly cross-grained, porous wood, somewhat similar in color to cedro. Suitable for a cabinet wood. (Hill and Sudworth, p. 29.)

Grosourdy (2: 387) refers this variety to both *Guarea trichilioides* and *Trichilia moscata* and describes it as an abundant wild tree, 70 feet (21 meters) in height, whose long, straight trunk reaches a diameter of 6 or 6¼ feet (about 2 meters). It furnishes a rather hard wood of good weight, dense and close-grained, dark flesh-colored, and breaking with an oblique fracture. It is much appreciated for the construction of strong wagons and carriages and farm implements and in many branches of carpentry work.

Guaraguao cimarron. See *Trichilia havanensis.*

Guarea humilis. GUARAGUADILLO.

Family Meliaceae: a tree or shrub 5 meters high from Barranquitas and Adjuntas, Luquillo, and Naguabo. (Stahl, **2**: 168.)

Guarea swartzii. GUARAGUAO.

A large forest tree, 15 to 20 meters high. Wood like cedar in color, but harder; used for furniture. (Stahl, **2**: 166.)

This species is not now recognized as genuine, the Porto Rican form representing probably *G. trichilioides.*

The common name "acajou" is sometimes applied to this species.

Guarea trichilioides.

A tree having a musk-like perfume.

Guarema. See *Picramnia pentandra.*

A tree from the northeastern part of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood dark, hard; specific gravity, 1.213; used in building houses. (Exp. 1857.) (Grosourdy, **2**: 387.)

Guasa.

A tree from the eastern part of the island; height, 30 to 35 feet; diameter, 10 to 12 inches. Wood white, soft; specific gravity, 0.890; used in building houses. (Exp. 1857.)

Grosourdy says (**2**: 387), in addition, that the wood is resistant and breaks with a vertical fracture.

Guasábara. See *Eugenia tetrasperma.*

A tree from all parts of the island: height, 55 to 60 feet (15 to 18 meters); diamter, 12 to 15 inches (30 to 37 centimeters). Wood flesh-colored, hard; specific gravity, 0.947; used for cabinet work. (Exp. 1857.)

Specific gravity 0.87 according to Captain Hansard.

Guasabarillo.

Perhaps the same as "guasábara," but with the specific gravity given as 0.78.

Guasávara. See *Eugenia aeruginea* and *E. eggersii.*

Another spelling of Guasabara; said by Grosourdy to be an abundant wild tree, 60 feet (18 meters) in height and 12 to 18 inches (30 to 37 centimeters) in diameter. The wood is strong, compact, and flesh-colored, and breaks obliquely. Its most common use is for fences and for fuel. (Grosourdy, **2**: 387.)

Guásima. See *Guazuma guazuma.*

A tree from all parts of the island: height, 35 to 40 feet (11 to 12 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood white, soft; specific gravity, 0.741; not used. (Exp. 1857.)

Captain Hansard gives a specific gravity of 0.35 under this name.

Guasimilla.

A wild tree, without doubt a variety of Guacima, 35 feet (11 meters) high and 12 inches (30 centimeters) in diameter. The wood is white, soft, and breaks with a vertical fracture. Its most common use is for framing country houses. (Grosourdy, **2**: 387.)

A tree from the eastern part of the island; specific gravity, 0.508. (Exp. 1857.)

Guatapaná.

A wild tree, 24 to 30 feet (7 to 9 meters) high, with a trunk 12 inches (30 centimeters) in diameter. The wood is dark-colored, hard, and resistant; used for shelving and in boat building. (Grosourdy, **2**: 388.)

A tree from the southern part of the island; specific gravity, 1.294. (Exp. 1857.)

Guauro. See *Vincetoxicum pubescens.*

Guava.

The English name of the well-known tropical fruit *Psidium guajava*, the Spanish name of which is "guayava." In Porto Rico the name guava is applied instead to a species of Inga, used as a shade tree for coffee. Captain Hansard claims to have been informed by Professor Hart, of the Trinidad Botanic Gardens, that the tree called guava in Porto Rico is not the genuine *Inga vera*, but our specimens seem to agree reasonably well with material from the other West Indies and from South America.

Guayaba. See *Psidium guajava.*

Guayabacison.

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 15 to 18 inches (37 to 45 centimeters). Wood pinkish, hard; specific gravity, 1.029; used in building houses. (Exp. 1857.)

Guayabacon. See *Eugenia aeruginea*, *Myrica divaricata*, and *M. leptoclada.*

A tree of the coasts, reaching 30 feet (9 meters) in height by 18 inches (45 centimeters) in diameter. The rose-colored wood is compact and strong, and difficult to break. It is used for beams and rafters in country houses. (Grosourdy, **2**: 388.)

Guayabillo. See *Eugenia pseudopsidium.*

Guayabillo de costa. See *Eugenia flavo-virens.*

Guayabo.

A tree from all parts of the island; height, 12 to 15 feet; diameter, 6 to 8 inches. Wood flesh-colored, hard; specific gravity, 0.811; fruit tree. (Exp. 1857.)

Guayabota. See *Diospyrus ebenaster* and *Eugenia stahlii.*

A hard wood used in peasant houses for posts; flowers like Gardenia. Specific gravity of the wood, 0.66. (Hansard.)

Said by Grosourdy to be a variety of "guayabota rojo," with a lighter-colored wood. (Grosourdy, **2**: 388.)

Guayabota blanca.

A tree from all parts of the island; height, 20 to 30 feet (6 to 9 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood pinkish, soft; specific gravity, 0.686; not used. (Exp. 1857.)

Guayabota níspero. See *Maba sintenisii.*

Guayabota roja.

A rather abundant wild tree, reaching 30 feet (9 meters) in height, and 12 inches (30 centimeters) in diameter. The wood is red, rather soft, and not very durable, breaking with an oblique fracture. Its common use is for the framework of country houses. (Grosourdy, **2**: 388.

A tree from all parts of the island. Specific gravity, 0.667. (Exp. 1857.)

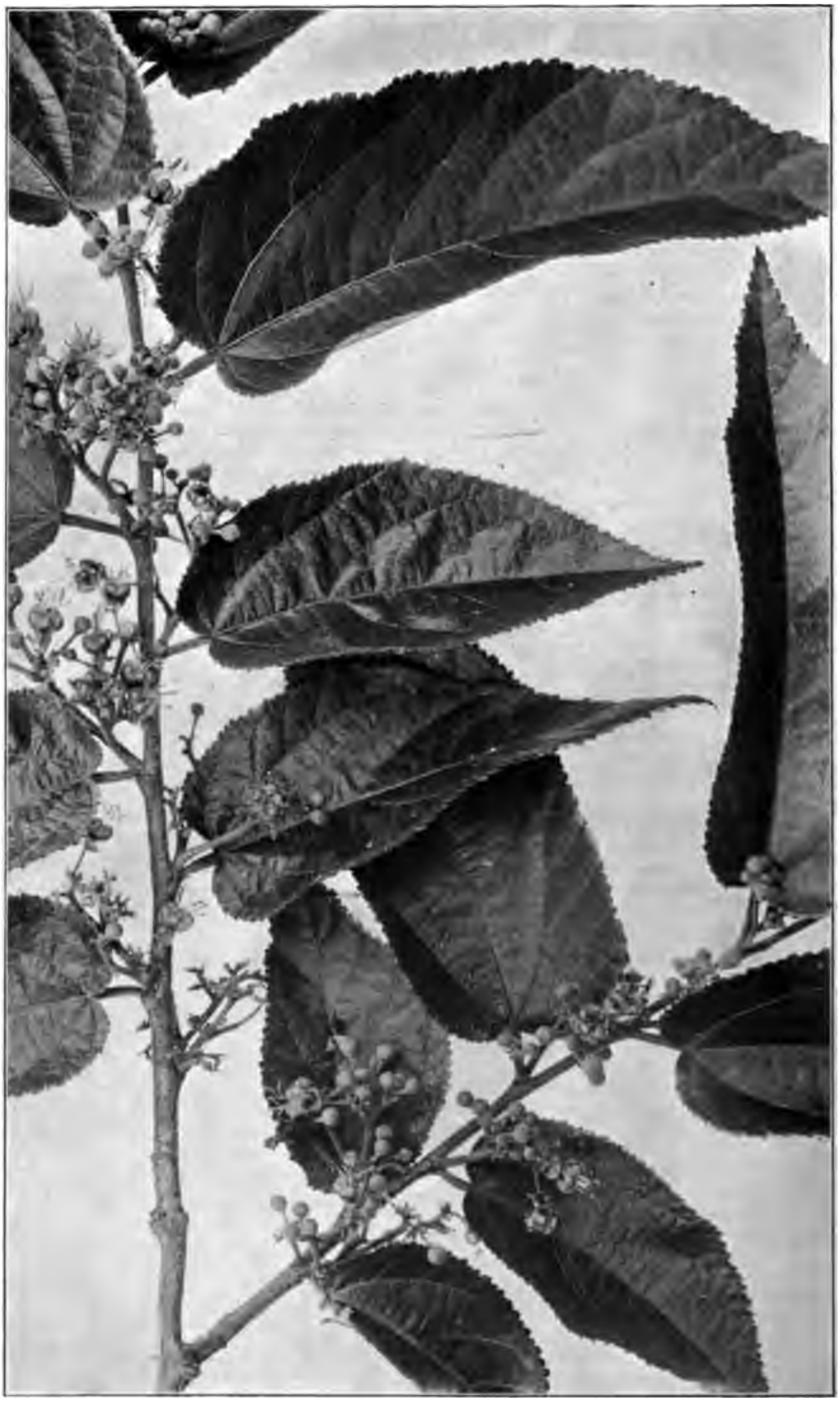
Guayacan. See *Guajacum officinale.*

Also called erroneously "guayavacan" by the peasants and others who have learned from them.

A tree from the southeastern part of the island; height, 40 to 45 feet; diameter, 12 to 15 inches. Wood greenish, hard; specific gravity, 0.972; used in making furniture. (Exp. 1857.)

Captain Hansard considers this the genuine lignum-vitae and gives the specific gravity as 1.16.

Heartwood dull yellowish-brown, with dark olive-brown streaks; sapwood pale yellow, with brownish areas. Minute ducts occurring singly and evenly scattered. Medullary rays very small and indistinct. Smoothed surface, oily to the touch. Exceedingly hard, brittle, and difficult to cut. Resembles *Guajacum officinale*, and is probably *G. sanctum*. It grows in comparative abundance in the entire mountain chain and on the southern coast of the island, producing a wood which is very solid and resistant. On this account it is much sought after in the ship-



GUÁCIMA (GUAZUMA GUAZUMA). COAMO SPRINGS.

yards for blocks and pulleys, for spokes and tires, and many other things which require great strength. Water boiled with this wood is an antivenereal specific and cures ulcers produced by this disease. The resin from the "guayacan," lignum-vitae, is highly valued for gout. The Caribbeans apply it to other local ailments, and foreigners extract it freely on the southern coast equally with the "ucar," "expinillo," "palo de Maria," "palo de Brazil" and others, for dyes and coloring matter. (Hill and Sudworth, 27.)

Guayacancillo. See *Guajacum sanctum.*

Grosourdy (**2**: 389) refers this to *G. verticale* and suggests that it is possibly only a variety of *G. officinalis.*

Guayacan de vera.

A name applied at Yauco to guayacan wood with white and yellow spots.

Guayaco.

Reported by Hill among resin-yielding trees. Perhaps "guayacan" was intended.

Guayánilla amarilla.

A tree from all parts of the island; height, 40 to 45 feet; diameter, 12 to 15 inches. Wood yellow, hard; specific gravity, 1.088; used for cabinetwork. (Exp. 1857.)

Guayánilla prieta.

A tree from the interior of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood dark yellow, hard; specific gravity, 1.116; not used. (Exp. 1857.)

Guayarote. See *Meliosma obtusifolia.*

Guayava. See *Psidium guayava.*

Guayava pera. See *Psidium guayava.*

A name applied to the pear-shaped varieties of the guava.

Guayavacon. See *Myrcia leptoclada* and *Trichilia hirta.*

Guayavita. See *Amomis caryophyllata.*

Guazuma guazuma. GUÁCIMA DEL NORTE. PLATE XXXVI.

A common tree belonging to the family Sterculiaceae; Stahl ascribes qualities similar to those noted under *G. tomentosa*, and gives the name "guácima del norte." (Stahl, **2**: 105.)

A wild tree very common throughout the Antilles and also on the continent. It reaches 30 to 40 feet (9 to 12 meters) in height, with a rather straight trunk 15 to 18 inches (37 to 45 centimeters) in diameter. A variety of the mountains with rather small leaves is somewhat larger and taller. Furnishes a rather light wood that is undoubtedly resistant, fibrous in texture, light gray in color, slightly mixed with rose or flesh color in unequal stripes that produce a handsome appearance. This wood has no heart, and some specimens are reddish-gray mottled almost uniformly. It has no use, but would appear suitable for fences, the interior of houses, etc. It serves for fuel, and the light charcoal is good for making powder. Specific gravity, 0.552. The common name is sometimes spelled "guázima" and "guásima." (Grosourdy, **2**: 385.)

Guazuma tomentosa. GUÁCIMA DEL SUR.

A tree common on the southern coast of the island. (Stahl, **2**: 106.) In Jamaica is said to be a tree 20 to 25 feet (6 to 8 meters) high; foliage and fruit eaten by cattle. The light wood is used for making sugar hogsheads.

Guazuma ulmifolia. See *Guazuma guazuma.*

Guerrero. See *Eupatorium dalea, E. portoricense*, and *E. resinifluum.*

Guettarda krugii.

A recently described rubiaceous tree, attaining a height of 10 meters; known from the vicinity of Guanica. (Urban, Symb. **1**: 431.)

Guettarda laevis.

A tree 15 to 20 meters high from the primeval forests of the mountains of Luquillo and Naguabo. (Urban, Symb. **1**: 433.)

Guettarda ovalifolia.

A tree 8 to 10 meters in height, recently described from the region of Cayey, Adjuntas, and Maricao. (Urban, Symb. **1**: 432.)

Guettarda pungens.

The midrib of the small leathery leaves of this species is produced into a sharp spine. Known from Maricao. (Sintenis.)

Guettarda scabra. PALO DE CUCUBANO.

A tree 3 to 5 meters high, growing on mountains and in waste places. (Stahl, **5**: 56.)

Guichara. See *Lagenaria vulgaris.*

The grooved musical instrument made from the gourd; also called "guira" and "caracho."

Guilandina bonduc. See *Caesalpinia bonduc.*

Guilandina bonducella. See *Caesalpinia bonducella.*

Guinea grass. See *Panicum maximum.*

Guinea-hen's weed. See *Petiveria alliacea.*

Guinea pepper. See *Capsicum.*

Guineos.

A variety of banana.

Guingambo. See *Abelmoschus esculentus.*

Guira. See *Lagenaria vulgaris.*

One of the names applied to the grooved gourd used as a musical instrument.

Guitaran.

A low tree growing on the coast, reaching 18 to 20 feet (5 to 6 meters) in height, with a trunk 10 or 12 inches (25 to 30 centimeters) in diameter. The wood is rose-colored and breaks easily with a vertical fracture. Has no application. (Grosourdy, **2**: 389.)

A tree from the interior of the island; height, 18 to 20 feet; diameter, 10 to 12 inches. Wood pinkish, soft; specific gravity, 0.863; used for cabinetwork. (Exp. 1857.)

Gum arabic. See *Acacia arabica.*

Guyabacoa. See *Rheedia portoricensis.*

Guyacan. Probably an error for Guayacan.

Guzmannia sintenisii.

Family Bromeliaceae; from Sierra de Luquillo.

Gynandropsis speciosa. VOLATINES PRECIOSOS.

Family Capparidaceae; an herbaceous annual cultivated in gardens; 1 meter high. (Stahl, **2**: 42.)

Gynerium saccharoides. CAÑA DE CASTILLA.

Habas. See *Phaseolus lunatus.*

Habichuela. See *Phaseolus vulgaris.*

Habichuela cimarrona. See *Phaseolus adenanthus* and *Phaseolus lanceolatus.*

Habichuela parada. See *Phaseolus semierectus.*

Hacana. See *Lucuma multiflora.*

A tree from all parts of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 8 to 10 inches. Wood white, rather hard; specific gravity, 0.924; not used. This is perhaps the same as "acana" and "jacana." (Exp. 1857.)

Hacanilla. See *Ardisia purpurascens.*

This name was perhaps intended for "jacanillo," applied to *Ardisia pendula.*

Hachuelo. See *Pictetia.*

"Color, rich dark yellowish-brown, with streaks and mottlings of light yellow-brown. Ducts minute, very numerous, occurring singly, and irregularly diffused between the medullary rays or often interrupting the rays. Medullary rays very numerous, indistinct. Wood fibers interlaced, but appearing rather straight grained on the finished surface. Valuable for cabinetwork." (Hill and Sudworth.)

Hachuelo.

An erroneous name given by Hill for the calabash tree. *Crescentia cujete*, which seems also to have been confused by him with "tachuelo" or Pictetia.

Haematoxylon campechianum. PALO DE CAMPECHE.

Family Cassiaceae; a medium-sized tree yielding the logwood of commerce. (Stahl, **3**: 104.)

A wild tree reaching 30 to 45 feet (9 to 14 meters) high, but with short trunk seldom attaining 6 or 9 feet (2 to 3 meters); very crooked and irregular, prolonged into large branches rather long and straight. The diameter of the trunk is 18 to 24 inches (45 to 60 centimeters); of the branches 8 to 10 inches (20 to 25 centimeters). The wood is very hard and heavy, compact in texture, dark purple with darker stripes, frequently tinted with orange, especially toward the outside, which is lighter, variegated with orange. Without doubt at the fall of the tree the wood is of one color, a reddish white, and takes on its beautiful color little by little after exposure to the air. Specific gravity, 0.992.

The wood is not only used as a dye, but can be utilized in turning. (Grosourdy, **2**: 369.)

Haemocharis portoricensis. NIÑO DE COTA.

An indigenous tree belonging to the Theaceae and closely related botanically to the tea shrub. It is reported from the primeval forests of the mountain of Luquillo and Naguabo at an altitude of 1,000 meters.

Haenianthus obovatus.

An oleaceous shrub described from specimens collected on El Yunque. (Urban, Add. **1**: 58.) Also from the mountain of Luquillo.

Hamelia lutea. BÁLSAMO AMARILLO.

Family Rubiaceae; an annual herbaceous shrub, 1 meter high, found along the foothills and shaded woody places. (Stahl, **5**: 40.)

Hamelia patens. BÁLSAMO COLORADO.

An erect biennial shrub, 1 meter high, in stony places in the mountains. Our specimens (No. 619) are from the vicinity of Coamo. (Stahl, **5**: 41.)

Hat palm. See *Inodes causiarum.*

Haya. See *Oxandra laurifolia.*

A tree from the interior of the island; height, 30 to 35 feet; diameter, 8 to 10 inches; specific gravity, 0.705. (Exp. 1857.)

The wood is dirty white, flexible, and breaks with a vertical fracture. Its common use is for oars and the frames of country houses. (Grosourdy, **2**: 389.)

Haya blanca. See *Oxandra laurifolia.*

Haya prieta. See *Oxandra virgata.*

Hebeclinium macrophyllum. See *Eupatorium macrophyllum.*

Hecastophyllum brownei. See *Dalbergia ecastophyllum.*

Hecastophyllum monetaria. See *Dalbergia monetaria.*

Heckeria peltata. PLATE XXXVII.

Family Piperaceae: a large, succulent herb with peltate, heart-shaped leaves.

Heckeria umbellata. PLATE XXXVIII.

A species appearing very similar to the preceding but very different on close inspection. The stems and petioles have prominent ridges fringed with rows of long hairs; the internodes and peduncles are shorter, the petioles not expanded at base, and the leaves are not peltate but have an open sinus. Both species were collected along the Military Road a short distance south of Rio Piedras.

Hedionda. See *Cassia occidentalis.*

In the market of Ponce roots called "hedionda" were being sold by an herb dealer as a remedy for flatulence.

Hediondilla. See *Leucaena glauca.*

Hedwigia balsamifera. See *Tetragastris balsamifera.*

Hedychium coronarium.

Family Zingiberaceae: reported from Cayey and Maricao. Also collected at Adjuntas.

Hedyosmum arborescens.

Family Chloranthaceae; a shrub 12 to 16 feet (4 to 5 meters) high, in mountain woods. A related species is called "headache weed" in Jamaica. Reported from Sierra de Luquillo.

Hedyotis glomerata. See *Oldenlandia glomerata.*

Heliconia.

A species of Heliconia is reported by Hill, apparently on the authority of Eggers, in a list of trees of the mountains. This genus is quite closely related to the banana, but the fruit is a dry capsule with three seeds or less.

Heliconia bihai.

A musaceous tree 10 or 12 feet (3 or 4 meters) high, reported from Bayamon, in forests on the mountains. Called bastard plantain in Jamaica.

Helicteres jamaicensis. CUERNECILLO.

Family Sterculiaceae: a shrub 2 to 3 meters high, in sands of the coast. Jacquin calls this "huevo de gato" (Stahl. 2: 102), while Bello gives simply "gato."

Heliophytum indicum. See *Heliotropium indicum.*

Heliophytum parviflorum. See *Heliotropium parviflorum.*

Heliotropium curassavicum. COTORRERA DE LA PLAYA.

Family Boraginaceae: a woody herb 50 centimeters high, growing in tufts in marshy ground along the seashore. (Stahl. 6: 106.)

Heliotropium indicum. COTORRERA.

An herbaceous, erect annual, 50 centimeters high; common. A decoction of this plant is said to act as a diuretic. (Stahl. 6: 108.) At Cataño this was called "yerba de cotorra," a translation of which would be "parrot grass," while at Ponce it is termed "yerba de culebra."

Heliotropium inundatum. COTORRERA DE AGUA.

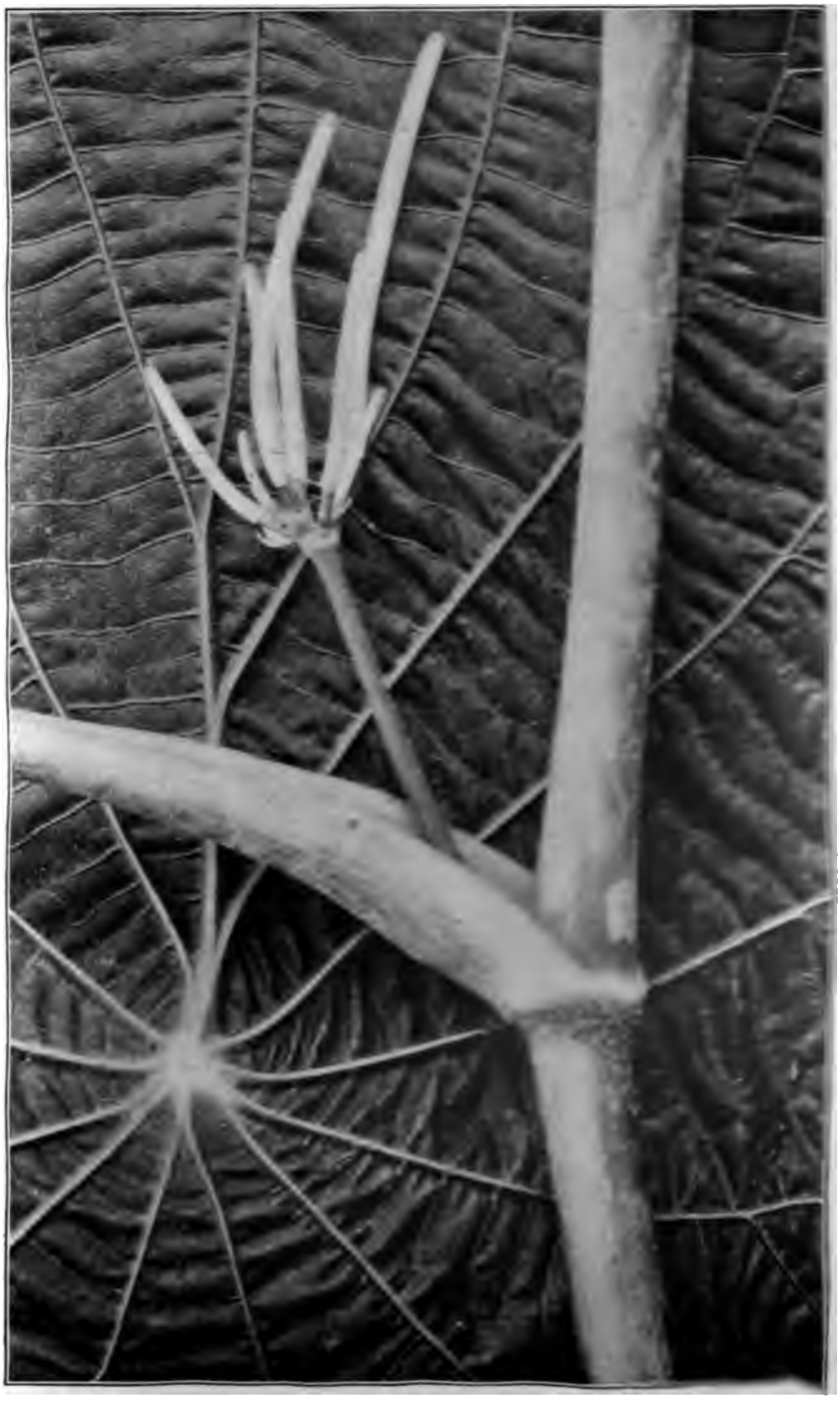
Said to be a woody herb, found in wet places along the seashore. (Stahl. 6: 107.)

Heliotropium parviflorum. COTORRERILLA.

A woody herb 50 centimeters high, growing in stony places. (Stahl, 6: 109, as *Heliophytum parviflorum.*)

Heliotropium peruvianum. HELIOTROPO.

A beautiful, fragrant species, cultivated in gardens. (Stahl. 6: 108.)



HECKERIA PELTATA; INFLORESCENCE AND CENTER OF LEAF.

Hebeclinium macrophyllum. See *Eupatorium macrophyllum.*

Hecastophyllum brownei. See *Dalbergia ecastaphyllum.*

Hecastophyllum monetaria. See *Dalbergia monetaria.*

Heckeria peltata. PLATE XXXVII.

Family Piperaceae; a large, succulent herb with peltate, heart-shaped leaves.

Heckeria umbellata. PLATE XXXVIII.

A species appearing very similar to the preceding but very different on close inspection. The stems and petioles have prominent ridges fringed with rows of long hairs; the internodes and peduncles are shorter, the petioles not expanded at base, and the leaves are not peltate but have an open sinus. Both species were collected along the Military Road a short distance south of Rio Piedras.

Hedionda. See *Cassia occidentalis.*

In the market of Ponce roots called "hedionda" were being sold by an herb dealer as a remedy for flatulence.

Hediondilla. See *Leucaena glauca.*

Hedwigia balsamifera. See *Tetragastris balsamifera.*

Hedychium coronarium.

Family Zingiberaceae; reported from Cayey and Maricao. Also collected at Adjuntas.

Hedyosmum arborescens.

Family Chloranthaceae; a shrub 12 to 16 feet (4 to 5 meters) high, in mountain woods. A related species is called "headache weed" in Jamaica. Reported from Sierra de Luquillo.

Hedyotis glomerata. See *Oldenlandia glomerata.*

Heliconia.

A species of Heliconia is reported by Hill, apparently on the authority of Eggers, in a list of trees of the mountains. This genus is quite closely related to the banana, but the fruit is a dry capsule with three seeds or less.

Heliconia bihai.

A musaceous tree 10 or 12 feet (3 or 4 meters) high, reported from Bayamon, in forests on the mountains. Called bastard plantain in Jamaica.

Helicteres jamaicensis. CUERNECILLO.

Family Sterculiaceae; a shrub 2 to 3 meters high, in sands of the coast. Jacquin calls this "huevo de gato" (Stahl, **2**: 102), while Bello gives simply "gato."

Heliophytum indicum. See *Heliotropium indicum.*

Heliophytum parviflorum. See *Heliotropium parviflorum.*

Heliotropium curassavicum. COTORRERA DE LA PLAYA.

Family Boraginaceae; a woody herb 50 centimeters high, growing in tufts in marshy ground along the seashore. (Stahl, **6**: 106.)

Heliotropium indicum. COTORRERA.

An herbaceous, erect annual, 50 centimeters high; common. A decoction of this plant is said to act as a diuretic. (Stahl, **6**: 108.) At Cataño this was called "yerba de cotorra," a translation of which would be "parrot grass," while at Ponce it is termed "yerba de culebra."

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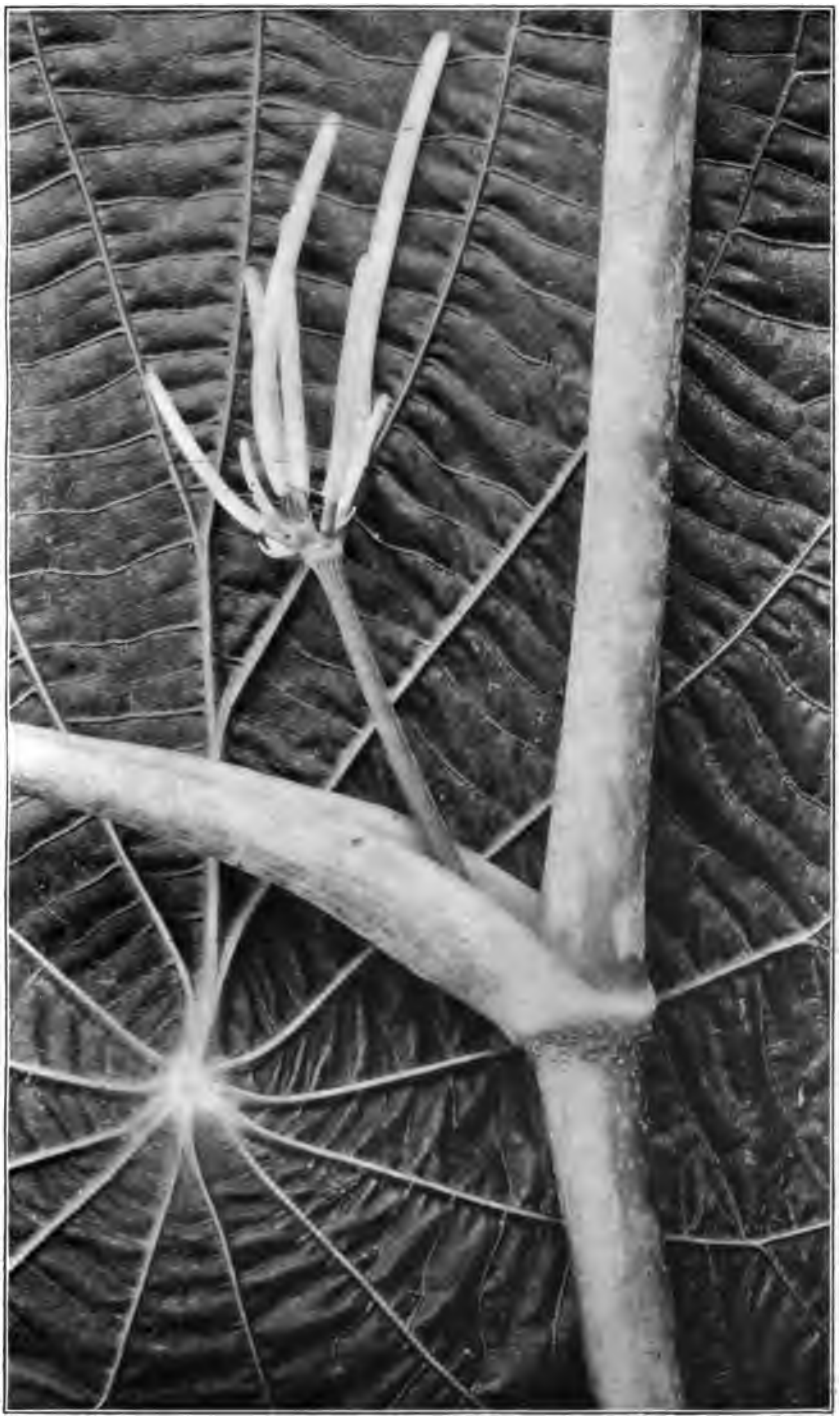
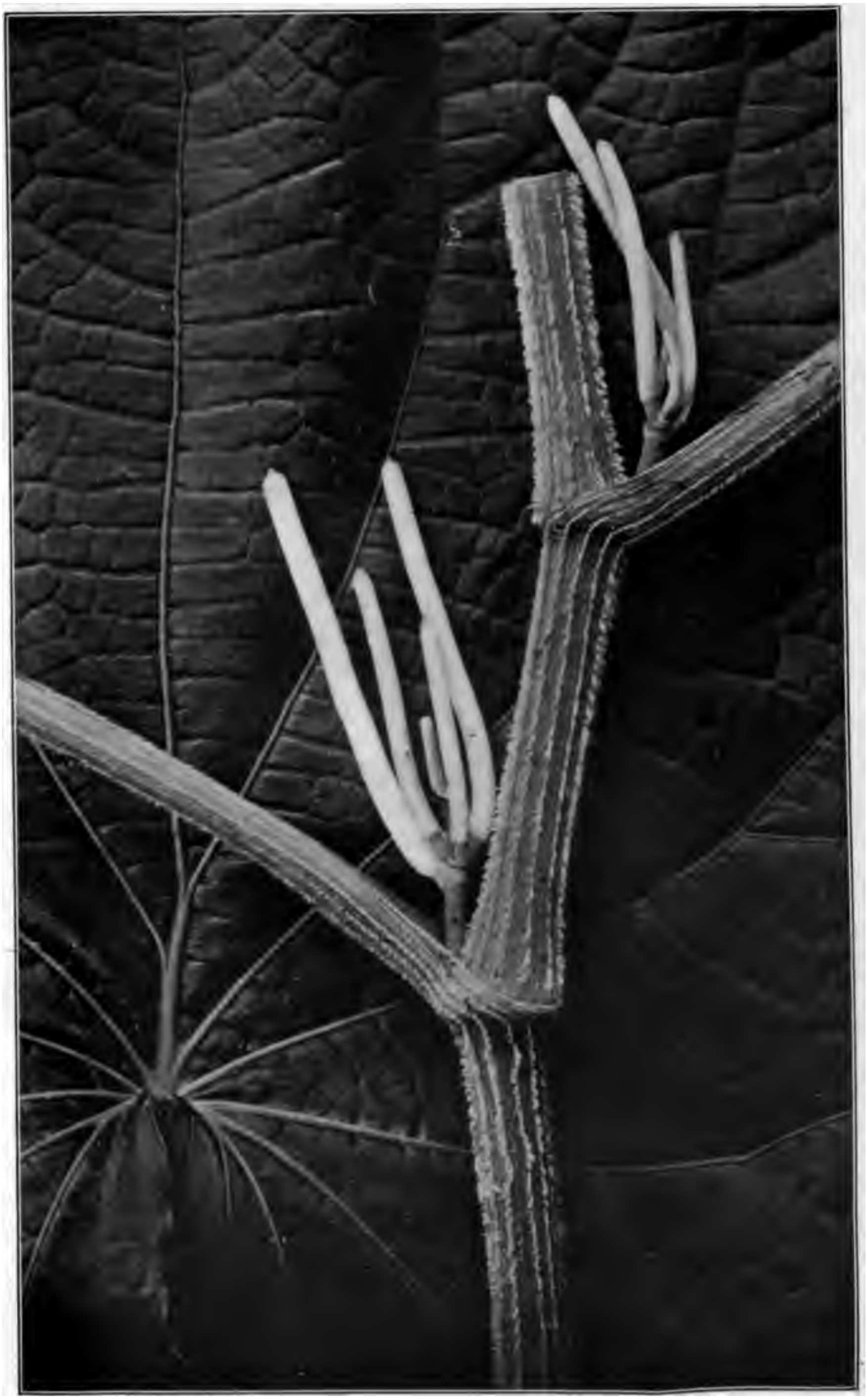
A woody herb 50 centimeters high, growing in stony places. (Stahl, **6**: 109, as *Heliophytum parviflorum.*)

Heliotropium peruvianum. HELIOTROPO.

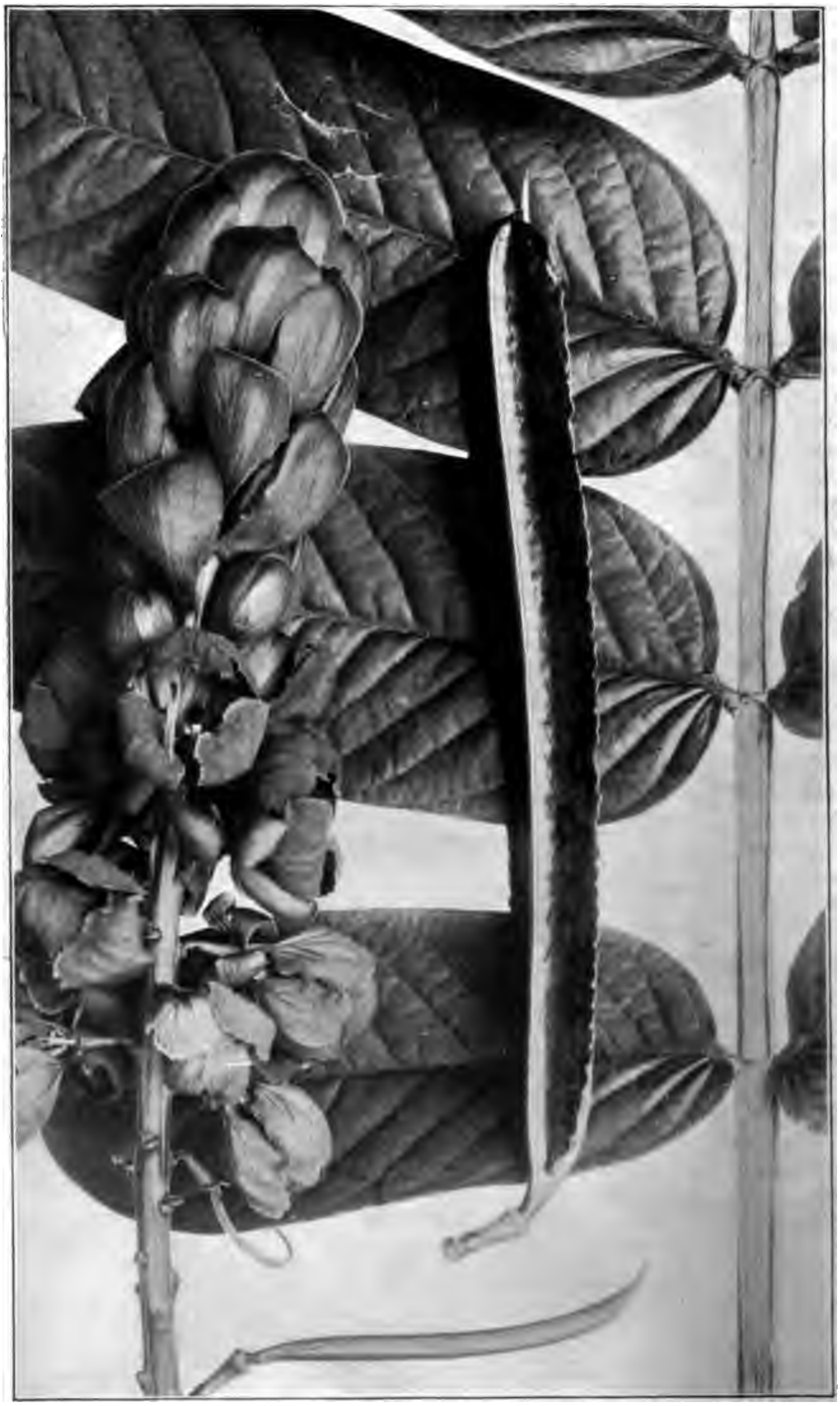
A beautiful, fragrant species, cultivated in gardens. (Stahl, **6**: 108.)



HECKERIA PELTATA; INFLORESCENCE AND CENTER OF LEAF.



HECKERIA UMBELLATA; INFLORESCENCE AND CENTER OF LEAF.



TALANTALA (HERPETICA ALATA). AT CATAÑO.

Heliotropo. See *Heliotropium peruvianum.*

Henna. See *Lawsonia inermis.*

Henriettella fascicularis. CAMACEY SIMPLE.

Family Melastomaceae; a shrub 3 to 4 meters high; grows on mountains above 500 feet elevation. (Stahl, 4: 114.)

Herbeclinium macrophyllum. See *Eupatorium macrophyllum* and *Bacopa chamaedryoides.*

Hernandia sonora.

Family Hernandiaceae; a tree with large peltate leaves, the juice of which is said to be a powerful depilatory; reported from near Rincon and Yabucoa.

Herpestis monniera. See *Bacopa monniera.*

Herpetica alata. TALANTALA. PLATE XXXIX.

Family Cassiaceae; a shrubby plant 4 to 8 feet high, also called ringworm shrub in Jamaica on account of its reputed healing properties for that disorder. Bello gives the common name as "talantro." (Stahl, 3: 107, as *Cassia alata.*)

Heteropteris bellonis. AHORCA CABALLO.

An indigenous, climbing shrub of the family Malpighiaceae. From Sabana Grande, Maricao, and Lares. Appears in Stahl's "Flora" as *Stigmatophyllon chrysophylla.*

Heteropteris chrysophylla. BEJUCO DE PARALEJO.

A vine found by Stahl at Humacao. (Stahl, 2: 147).

Heteropteris laurifolia. PARALEJO VELLUDO.

A shrub 2 to 3 meters high; collected by Heller near Mayaguez. (Stahl, 2: 149, as *Heteropteris pubiflora.*)

Heteropteris pubiflora. See *Heteropteris laurifolia.*

Heteropteris purpurea. BEJUCO DE PARALEJO ROSADO.

A low, woody climber among shrubs. (Stahl, 2: 148.)

Hibiscus abelmoschus. See *Abelmoschus abelmoschus.*

Hibiscus bifurcatus. BUENOS DIAS.

An herbaceous, woody annual, 1 to 2 meters high, found in shady waste places. (Stahl, 2: 91.)

Hibiscus elatus. EMAJAGUA EXCELSA.

A spreading tree growing to be 60 feet high and 8 feet through; used for lumber; does not corrode the nails; very durable; the bark is said to make good rope. (Stahl, 2: 95, as *Paritium elatum.*)

Hibiscus esculentus. See *Abelmoschus esculentus.*

Hibiscus mutabilis. MARAVILLA.

A shrub 3 to 4 meters high, cultivated in gardens for its flowers. (Stahl, 2: 89.)

Hibiscus radiatus. PAVONA ENCENDIDA.

A woody shrub, 1 meter high, cultivated in gardens. (Stahl, 2: 90.)

Hibiscus rosa-sinensis. PAVONA.

A shrub 3 to 4 meters high, cultivated in gardens for its beautiful flowers. Introduced from Asia. At Santurce this species was called "mapola." (Stahl, 2: 88.)

Hibiscus sabdariffa. JAMAICA SORREL. VIÑA.

A shrubby annual or biennial, valued for the fleshy red calyx, which has a sharp but not unpleasant acid taste. The jellies and sauces made from it have been compared to those obtained from cranberries. In British India this plant is the basis of a considerable agricultural industry, it being grown there both for the calyx and for a fiber extracted from the stems by a process of retting. For this purpose the crop is cut while in flower, dried, made into bundles, and soaked in water for fifteen to twenty days. It is then possible to wash out a strong, silky fiber known in commerce as Rozelle hemp, considered by some to be the equal of jute, although little or none is exported to Europe. The natives use it mostly for cordage and coarser textile purposes. The seeds are employed in various medicinal decoctions and compounds on account of supposed demulcent, diuretic, and tonic properties, and the calices are also made into a refreshing acid drink for fever patients and convalescents.

The calices and young capsules may be preserved by drying, and in this condition are sometimes met with in tropical markets. The leaves are also an ingredient in certain dishes and the seeds are fed to cattle. Analyses show considerable quantities of tartaric and malic acid, but no citric, and the Jamaica sorrel thus supplements the lime in the direction of the qualities of our temperate fruits. It is becoming increasingly popular with the people of Florida, and is now commonly cultivated in the southern part of that State. Americans in Porto Rico would do well to become acquainted with it. The species has been reported by Bello with the above native name as growing in country districts in the western part of the island, but is probably to be found occasionally elsewhere. Also called "aleluya roja de Guinea" and "agrio de Guinea."

Hibiscus schizopetalus. LIRA. PLATE XL.

A shrub 6 to 8 feet (2 to 2.5 meters) high, of very slender trailing habit; cultivated for its very peculiar pink flowers. The petals are split into a fringe of narrow divisions and the stamen tube and style are extremely long.

Hibiscus tiliaceus. See *Paritium tiliaceum.*

Hibiscus tomentosus. MALVAVISCO AFELPADO.

An herbaceous, woody annual; grows in swamps between Cataño and Palo Seco; 1 to 2 meters high. (Stahl, 2: 92.)

Hicaco. See *Chrysobalanus icaco.*

Hicaquillo. See *Dendropremon caribaeus* and *Loranthus americanus.*

Hicaquillo del combron. See *Dendropremon bicolor.*

Hierba. See *Yerba.*

Hieronymia alchornoides.

An euphorbiaceous tree, reported from Sierra de Lares.

Higo. See *Ficus carica.*

Higrofila de Puerto Rico. See *Hygrophila portoricensis.*

Higüera. See *Crescentia cujete.*

Hansard gives this wood a specific gravity of 0.51 and doubtfully refers it to the fig tree.

Higüerilla. See *Crescentia cucurbitina.*

Higuerillo. See *Vitex divaricata.*

A tree from all parts of the island; height, 25 to 30 feet; diameter, 10 to 12 inches. Wood ash-colored, hard; specific gravity 0.805; used for cabinet work. (Exp. 1857.)

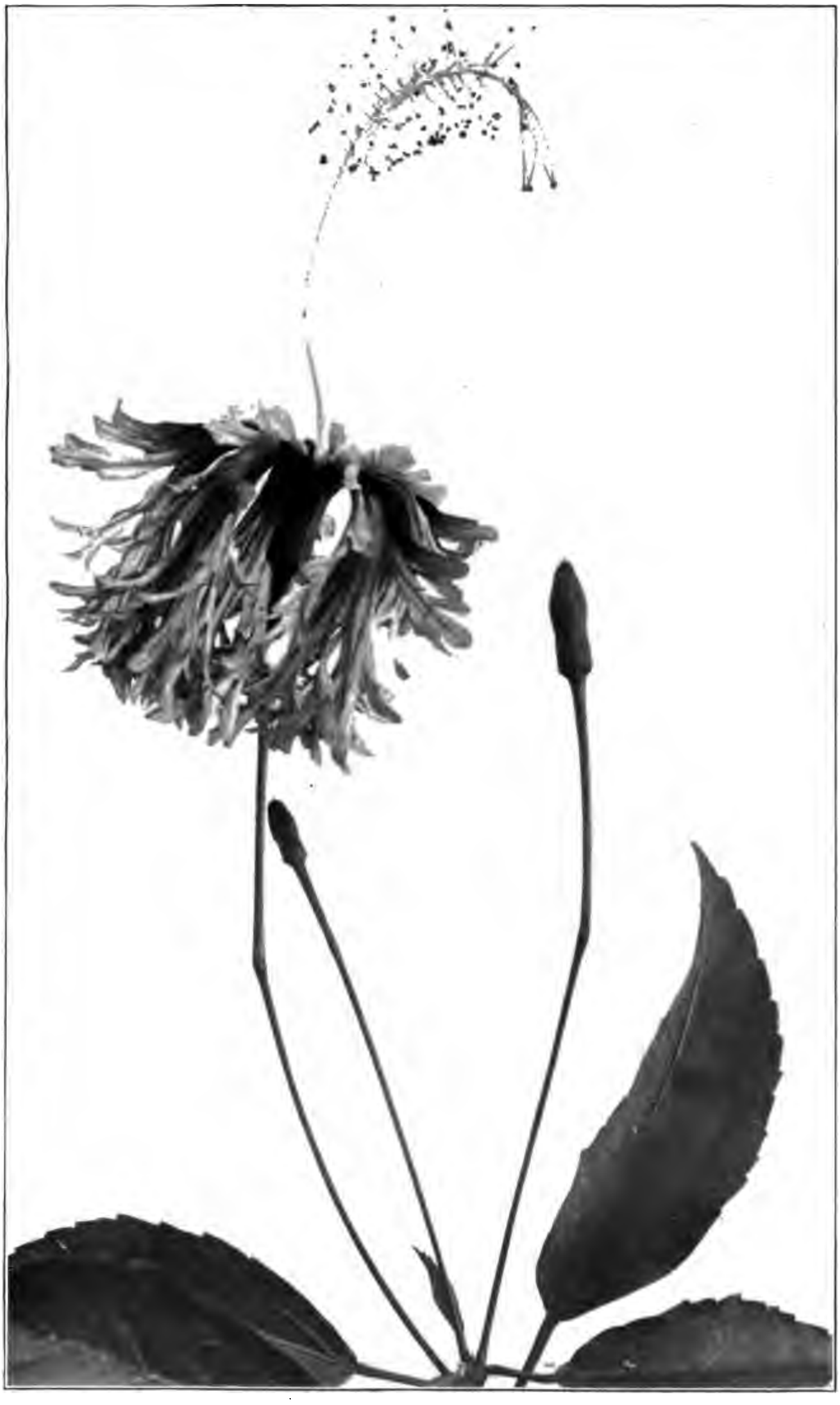
Captain Hansard gives 0.61 as the specific gravity of this wood.

Said by Grosourdy (2: 390) to break with a vertical fracture, and to be used for shelves, boards, framework of houses, etc.

Higuereta cimarrona. See *Jatropha gossypifolia.*

Higüerito. See *Crescentia microcarpa.*

Higüerito de Sierra. See *Schlegelia axillaris* and *Schlegelia brachyantha portoricensis.*



LIRA (HIBISCUS SCHIZOPETALUS).

Higuero.

A tree from all parts of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood light, soft; specific gravity 0.638; not used. (Exp. 1857.)

Higuillo. See *Plumbago scandens.*

A tree from all parts of the island; height, 15 to 20 feet (5 to 6 meters); diameter, 5 to 6 inches. Wood white, soft; specific gravity, 0.689; not used. (Exp. 1857.)

Higuillo amargo. See *Piper citrifolium.*

Hippocratea ovata. BEJUCO PRIETO.

Family Hippocrateaceae; a woody climber. (Stahl, **4**: 39.)

Hippocratea scandens.

A woody climber; reported from Sierra de Luquillo.

Hippomane mancinella. MANCHINEEL. MANZANILLO.

Reported by Hill as a tree of the coast region. A member of the Euphorbiaceae and related to the tallow tree, *Sapium sebiferum.* The wood makes handsome furniture and takes a high polish. The abundant milky juice is extremely poisonous to most persons, although some are not affected by it. In the eye it is said to cause temporary and even permanent blindness. Its deleterious properties have, however, been greatly exaggerated, to the effect that sleeping in its shade is considered fatal. The fruit has somewhat the appearance of a small apple, whence the Spanish name. The acrid juice attacks the mouth and prevents one eating a fatal quantity. Hill's account may be quoted as well illustrating the popular belief, page 38:

"The alleged effects of the guao tree upon man and animal have just been related, but more serious still are said to be the results of resting in the shade of the manzanillo or manchineel. This tree spreads throughout the seacoasts and river banks; is covered with regular leaves; its stem almost two feet in circumference; its bark smooth and delicate; the flowers rose-tinted. It is loaded with small, apple-like fruit of a pleasant appearance and odor; the leaves resemble those of the pear tree; the entire tree is full of a milky juice, which exudes in the heat of the sun. According to current belief, as frequently related by the writer, the incautious traveler, attracted by the beautiful appearance of the manzanillo, reposes in its shade, soon finds himself poisoned, and if lacteal substance falls upon him from the leaves, or if he touches the leaves he suffers as from the application of some blistering substance. It is also said that a fish which eats the fruit becomes infected, the gills becoming yellow and black, and one who eats the fish in this state is said to fall into a profound lethargy, with a general relaxation of all the limbs, according to the quantity of the fish he has eaten. This effect, according to popular belief, continues twenty-four hours, and frequently results in death. The use of brandy or other spirituous liquors or the drinking of sea water is considered beneficial as an antidote."

Furnishes a valuable wood for fine furniture, as easy to work as mahogany, whose properties and durability it possesses. It is of ordinary weight and hardness, fine-grained, and somewhat fibrous in texture. Its color is a handsome yellowish gray tinged with brown, with brown or black lines. This wood should not be worked until thoroughly dried and seasoned. Specific gravity, 0.674. (Grosourdy, **2**: 401.)

Hirtella.

A genus, according to Stahl, of two Porto Rican species, *H. triardra* and *H. rugosa*, both bearing the common name "tete de burro." They are shrubs or small trees and are related to Chrysobalanus, which Stahl considers the type of a distinct family of Leguminosae, although the prevailing tendency is to place it in the Rosaceae.

Hog plum. See *Spondias lutea.*

Hog weed. See *Boerhavia.*

Hoja de yagua.

The leaf base of the royal palm.

Hoja menuda. See *Calyptranthes sintenisii*, *Eugenia biflora ludibunda*, *E. buxifolia*, *E. ligustrina*, *E. monticola*, *E. poiretii*, *E. procera*, *Myrcia coriacea*, *M. paniculata*, and *M. splendens.*

A tree from all parts of the island; height, 12 to 15 feet (3.5 to 4.5 meters); diameter, 8 to 10 inches. Wood, ash colored, hard; specific gravity, 0.822; used for stakes. (Exp. 1857.)

Grosourdy adds (**2**: 390) that the wood is flexible, fibrous, and moderately resistant. Used also to make charcoal.

Homalium racemosum. TOSTADO.

Family Flacourtiaceae; a tree 5 to 8 meters high, found on mountains and in waste places. (Stahl, **4**: 161.)

Hordeum vulgare. CEBADA.

Barley is not raised in the island, but is imported in small quantities, mostly for making soups and for barley water, which is used as a drink.

Horse bean. See *Canavalia gladiata.*

Horseradish tree. See *Moringa pterygosperma.*

Hortegon.

Hansard gives this wood a specific gravity of 1.25. It varies in color from deep red to black and is very durable and hard. The leaf is large. When making boundaries a piece 2 or 3 feet long is put in the ground and lasts indefinitely.

Hortegon labrado.

A wild tree not commonly met with, and then only in the northeast part of the island. It reaches a height of 60 feet, and the diameter of the long straight trunk is not over 2 feet. It furnishes a very coarse, flesh-colored wood of the greatest durability. It breaks with difficulty with a vertical fracture. Its common use is for shelving in houses. (Grosourdy, **2**: 390.)

Specific gravity, 1.207. (Exp. 1857.)

Hortegon prieto.

A tree from all parts of the island; height, 75 to 80 feet; diameter, 20 to 25 inches. Wood dark, very hard; specific gravity, 1.064; used for cabinet work. (Exp. 1857.)

Grosourdy says this is but a variety of "hortegon labrado." The only difference being the brown-colored wood. It is used in the same way. (Grosourdy, **2**: 390.)

Hortonos.

A variety of banana or plantain mentioned by Hill, but not described.

Hoya carnosa.

An ornamental plant of the milkweed family, introduced from the Malay region and now naturalized in several of the West Indies.

Hucar.

"Bois immortelle," good for coffee and cacao shades; specific gravity, 1.06 (Hansard). See also "bucar" and "ucar."

Probably refers to *Erythrina poeppigiana.*

Hucar amarillo.

A tree from all parts of the island; height, 80 to 85 feet (24 to 25 meters); diameter, 50 to 55 inches (125 to 137 centimeters). Wood yellowish, very hard; specific gravity, 1.080; used in boat building. (Exp. 1857.)

Captain Hansard calls this "bois immortelle" and says that it is good for coffee and cacao shades; specific gravity given at 1.07.

Hucar blanco. See *Bucida buceras.*

A tree from all parts of the island: height, 80 to 85 feet (24 to 25 meters); diameter, 45 to 80 inches (112 to 200 centimeters). Wood white, very hard; specific gravity, 1.093; used in boat building. (Exp. 1857.)

Hucar colorado.

Bois immortelle, good for coffee and cacao shades. Specific gravity, 0.93. (Captain Hansard.)

Hucar prieto.

A tree from all parts of the island; height, 70 to 75 feet (21 to 23 meters); diameter, 40 to 45 inches (100 to 112 centimeters). Wood dark, very hard; specific gravity, 1.073; used in boat building. (Exp. 1857.)

Grosourdy (**2**: 390) says this is a variety of "hucar blanco" (*Bucida buceras*) differing only in having the wood dark gray in color.

Hucarillo.

A tree from the eastern part of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 20 to 24 inches (50 to 60 centimeters). Wood white, hard; specific gravity, 0.943; used in building houses. (Exp. 1857.)

Captain Hansard gives a specific gravity of 0.80 for wood of this tree.

Huesillo. See *Mayepea domingensis.*

Hueso blanco. See *Mayepea domingensis.*

Hueso prieto. See *Ilex nitida.*

Huevo de gato. See *Helicteres jamaicensis.*

Hura crepitans. HAVILLA.

This or a related species is not unfrequently planted as a shade tree along roads, particularly between San German and Mayaguez. It reaches a rather large size (2½ feet—75 centimeters—in diameter) and has a spreading habit, but the wood is soft and brittle so that it suffered much damage from the hurricane. The trunk suggests that of the Ceiba, having prominent roots, large stout spines, and a similar light gray color. The habit of the branches is different, however, and the leaves are simple and cordate instead of palmately compound. They are also peculiar in having unusually numerous white veins. Hura belongs to the Euphorbiaceae, but differs from most of the family in having a seed capsule of numerous divisions, somewhat resembling, exteriorly, the fruit of Malva on a large scale. The flowers are also peculiar, the staminate being on a spike suggesting the Piperaceae or aroids; the pistillate flower is naked, with a large spreading trumpet-shaped, lacerate stigma. The seeds are loosened and rattle in their separate compartments, perhaps suggesting the name "sand-box tree," used in the English colonies. The name "monkey's dinner-bell" is also applied in allusion to the fact that the ripe fruit splits with a loud report.

The slightly milky juice is acrid and irritant, while the seeds are sometimes used as a purgative. An oil expressed from them is said to be less nauseous than castor oil and to be effective in smaller doses. The fruits of the Porto Rican trees were much less prominently ribbed than those figured in botanical works; possibly it represents a distinct species.

Grosourdy says of the wood that it is rather light and soft, fibrous in texture, and resistant to the action of water. It is nearly white with stripes of light brown of the same color as the heart. There is a variety, light brown in color, that is highly valued because canoes made of it are much stronger and last much longer than those made of the other varieties. Specific gravity, 0.465. It is used also for interior work in houses. In working this wood care should be taken that the dust does not enter the eyes or nose, as it is very irritating and produces considerable inflammation. It is sufficient that the face be covered with a gauze. The native name is here spelled "javillo." (Grosourdy, 2: 392.)

Huso.

A tree from all parts of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood greenish, very hard; specific gravity 1.114; used for cabinetwork. Also called "espinillo." (Exp. 1857.)

Color, light yellow, with irregular, thin, yellowish-brown streaks. Conspicuous ducts in short, detached chains (1 to 2 rows of cells) evenly diffused. Medullary rays minute, but distinct. Wood fibers strongly interlaced (crossgrained). Tough, uncleavable wood. Used for hubs. (Hill and Sudworth.)

Huso amarillo.

Specific gravity 0.88, according to Captain Hansard.

Huso blanco.

Captain Hansard says that this wood has a specific gravity of 0.89.

Huso colorado.

Specific gravity, according to Captain Hansard, is 1.30.

Hydrocotyle.

This is a genus of small umbelliferous herbs, growing in moist, shady places, and usually creeping by means of long rhizomes.

Hydrocotyle asiatica. See *Centella asiatica.*

Hydrocotyle hirsuta. YERBA DE CUARTO.

Hydrocotyle spicata. See *Hydrocotyle hirsuta.*

Hydrocotyle umbellata. YERBA DE CUARTO.

A creeping herb found in rivulets and swamps. Used by Brazilian natives to produce vomiting; also said to be an antidote for poison. Kills sheep if they feed upon it.

Hygrophila portoricensis. HIGROFILA DE PUERTO RICO.

Family Acanthaceae; an herbaceous annual somewhat fleshy, found in ponds and on sides of ravines. Peculiar to Porto Rico. (Stahl, 4: 243.)

Hymenaea courbaril. ALGARROBO. PLATE XLI.

Also called "courbaril" and in Jamaica "locust tree." It belongs to the family Cassiaceae and is a large tree 15 or more meters high. The fruit is a short, thick, and very hard pod, the seeds of which are embedded in a dry, sweet pulp, eaten by children. The pods frequently appear in the markets. This tree is said to produce the "gum animae" of commerce, which is thought to be a finer varnish than shellac.

Specific gravity of the wood, 1.06. (Hansard.) Jacquin says that the wood is very hard and tough and is used for cogged wheels in sugar mills. Lunan attributes a variety of medicinal virtues to the different parts of this tree. (Stahl, 3: 129.)

Grosourdy describes two varieties, which he calls "algarrobo amarillo" and "algarrobo colorado."

Hypelate paniculata. GAITA.

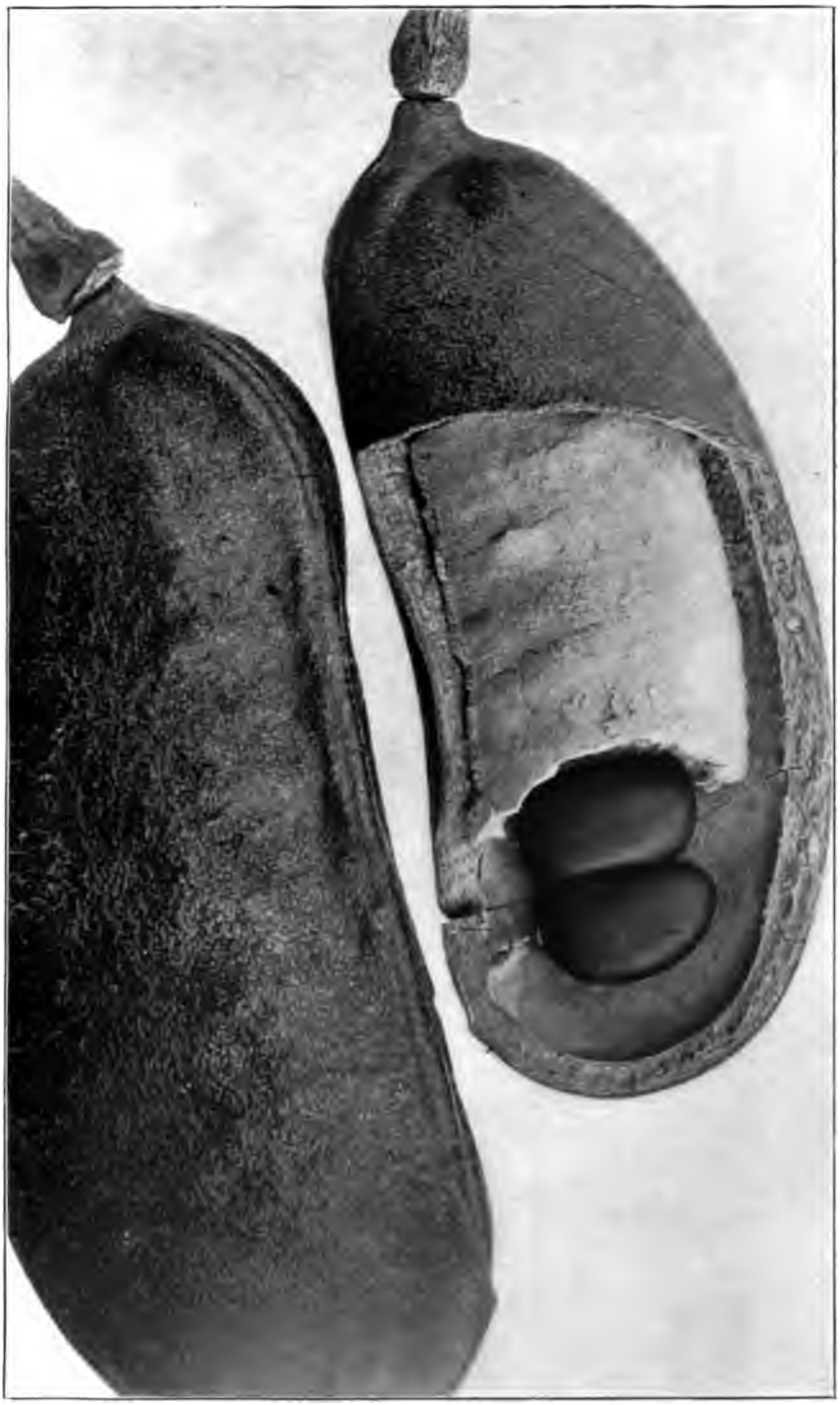
Family Sapindaceae; a low or middle-sized tree. (Stahl, 2: 161.)

Hyptis. See *Mesosphaerum.*

Iaya jabico. See *Erithalis fruticosa.*

Ibatia maritima. POPON.

A densely pubescent, climbing, asclepiadaceous plant preferring forests and thickets near the coast.



PODS OF ALGARROBA (HYMENAEA COURBARIL). PONCE MARKET.

Icaco. See *Chrysobalanus icaco.*

Icaque. See *Chrysobalanus icaco.*

Ileucedran.

Enumerated by Hill among forest trees yielding timber and fuel, but the name is admitted to be doubtful and seems not to have been printed elsewhere.

Ilex.

A large genus of Aquifoliaceae, including many West Indian shrubs and trees; several of the latter are called by the natives "cuero de sapo," but *I. macoucoua* and *I. ridlaei* have no local names reported.

Ilex dioica. CUERO DE SAPO.

A shrub, 3 to 5 meters high, found in the mountains and waste places; also called "brigueta." (Stahl, **4**: 36.)

Ilex macoucoua. BRIGUETA NARANJO.

A shrub, 3 to 5 meters high, found in waste places and in the mountains. (Stahl, **4**: 35.)

Ilex nitida.

According to Urban (Add. **1**: 35) variously known in Porto Rico as "cuero de sapo," "palo de hueso," and "hueso prieto." Reported from Bayamon, Sierra de Luquillo, Hato Grande, Cayey, Aibonito, Adjuntas, and Lares, in "coffee forests." Also known from Jamaica, Montserrat, and Martinique.

Ilex sideroxyloides. GONGOLIN.

A large tree reported from the Luquillo Mountains. There are two varieties, *portoricensis* and *occidentalis*. (Urban, Add. **1**: 32.)

Ilex urbaniana. CUERO DE SAPO.

A tree reported from primeval forest at Mameyes, near Utuado. (Urban, Add. **1**: 33.)

Ilysanthes gratioloides. See *Ilysanthes riparia.*

Ilysanthes riparia. YERBA GRACIOSA.

Family Scrophulariaceae; a procumbent herb growing in wet places. (Stahl, **6**: 236.)

India rubber vine.

See note under "rubber vine."

Indian almond. See *Terminalia catappa.*

Indian corn. See *Zea mays.*

Indian creeper. See *Quamoclit quamoclit.*

Indian pink. See *Quamoclit quamoclit.*

Indian shot. See *Canna.*

Indian sorrel. See *Hibiscus sabdariffa.*

Indigo. See *Indigofera anil.*

Indigo berry. See *Randia aculeata.*

Indigofera anil and I. tinctoria. INDIGO. AÑIL.

An annual or biennial leguminous shrub very common as a weed in waste places at low elevations in Porto Rico. Many species of plants are now known to produce indigo, but the species of Indigofera are preferred. In India *I. tinctoria* is generally cultivated, while in the American tropics *I. anil* is believed to have been much more commonly used. Careful comparative experiments regarding the value of these and other indigo-yielding plants seem not to have been made. Many of these could undoubtedly be grown successfully in Porto Rico, but unless improvements in the methods of manufacturing can be made it is not likely that there could be successful competition with the East Indies, whence the principal supply now comes. Prices vary at present from 60 cents to $1.20 per pound, depending upon quality. The competition of an artificial coal-tar product called alizarin, which threatened at one time to entirely replace indigo, is not feared so much as formerly, it having been found that indigo dyes are preferable for many purposes.

This crop was cultivated on a considerable scale in our Southern States during the eighteenth century, about 1,500,000 pounds being exported in 1794. The conditions were, however, not sufficiently favorable to enable the planters to withstand the competition of tropical countries where three crops can be cut each year, and production gradually ceased. At present we import indigo to the value of about $1,600,000 annually. Cultivation and manufacture are simple processes and have been well summed up in the following paragraph, extracted from a circular letter compiled by Mr. Lyster H. Dewey, of the Division of Botany. Although these operations are not complicated, much skill and experience are necessary in order to decide how long to continue the various stages of fermentation and aeration:

"Indigo is cultivated on sandy soil. The seeds are sown in spring either in drills or hills or broadcast. When sown in hills or drills it is cultivated or hoed. It is ready to cut from 45 to 60 days after seeding. The indigo is extracted by placing the plants, either fresh or after they have dried like hay, in a large tank, where they are covered with water. They are allowed to remain in the water about twenty-four hours, or a shorter time if the water is heated. It should not be boiled. The water is then drawn off into another tank, where it is stirred for at least three or four hours. Sometimes limewater is added during the stirring process to aid in precipitating the indigo. This is either allowed to settle in the tank where it is stirred or, more frequently, drained off into a third tank. The settling requires about twenty-four hours. When the indigo has settled to the bottom, leaving the water above practically clear, the water is carefully drawn off and the indigo is taken out and dried on cloths. When it is dried to about the consistency of molding clay it is usually made up into balls, and these are dried in the shade. When thoroughly dried and hard they are packed for market. The yield of indigo varies from 50 to 140 pounds per acre for each cutting. The average yield in Venezuela is about 112 pounds, but in the United States it was considerably less."

When planted in rows, these are about 2 feet (60 centimeters) apart, and 15 pounds (7 kilograms) of seed are used per acre. Blossoming is sometimes delayed for twelve weeks, and in some countries exposure of the cut indigo to the sun is considered detrimental. The average yield has been given as 300 pounds (142 kilograms) per acre. Although belonging to the Leguminosae, the indigo plant is said to rapidly exhaust the soil, so that planting on the same land can not be indefinitely repeated. Alternation with the pigeon-pea (Cajanus) has been advised.

In different countries there are also considerable differences in the methods of extraction, and in some parts of India the precipitate is boiled before being finally pressed and dried. This method is now defended by the best authorities as an improvement over that formerly followed in the United States and still generally prevalent in the American tropics.

The important difference in the market prices quoted above shows that quality is important in this product as in every other, and while indigo can not, perhaps, be recommended to the general farmer in Porto Rico, it is by no means certain that a properly organized plantation with a well-equipped and intelligently directed factory would not be a profitable enterprise. The production of indigo of high quality on a small scale is seldom accomplished, because of the absence of the most favorable conditions and best appliances; but in a large enterprise these can be profitably provided.

Another objection to indigo has been the injurious effect of the manufacturing processes upon the health of the operatives; but it would probably not be difficult at this time to provide machinery for stirring the tanks of fermenting indigo and also for handling and sacking the finished product.

Inga laurina. GUAMÁ.

Family Mimosaceae; a tree probably introduced, 30 to 50 feet (9 to 15 meters) high. The leaves usually with four leaflets. The flower clusters are longer and the stamens much shorter than in other members of this genus.

As a shade tree for coffee this species is second in importance only to the "guava" (*I. vera*). Specimens growing at Isolina were found in some cases at least to have tubercles on the roots.

According to Guerin, this tree is one of those employed in the cacao culture of Guadeloupe in making hedges or windbreaks which are planted across the direction of the prevailing winds at distances of 100 meters. Such hedges are used at elevations where permanent shade is thought not to be required, but where protection from the wind is necessary. In Venezuela and Colombia this is one of the favorite species for coffee shade. As a possible objection to it may be noted the report that it is susceptible to the disease called "mancha de hierro," or "iron rust," which has been very destructive to coffee, especially in overshaded plantations.

In Colombia, Saenz recommends the planting of this species at 15 meters where the temperature does not exceed 21° C.; in hotter regions a distance of 10 meters is advised. (Bull. 25, Division of Botany, U. S. Dept. Agr., p. 62.)

Reported from Utuado.

Inga vera. GUAVA.

A tree 30 to 50 feet (9 to 15 meters) high, producing round clusters of white flowers with very long stamens. As a shade tree for coffee this seems to be the favorite species in Porto Rico, with the related *Inga laurina*, or guamá, second. Both grow much less rapidly than the bucare (Erythrina), but are less liable to injury by hurricanes. In well-kept plantations the lower branches are trimmed out and the upper form an even layer of rather open foliage. But even where this amount of care is taken the shade is usually still too thick for the coffee to make normally vigorous growth, and the crop would probably be improved by the removal of alternate trees, so as to increase the distances to 30 or 40 feet.

The name of this tree is likely to be confused by the visitor with that of *Psidium guajava*, the well-known tropical fruit called guava in English, but by the Porto Ricans more correctly termed guayava. (Bull. 25, Division of Botany, U. S. Dept. Agr., p. 63.)

Tubercles were also observed on the roots of this species at Isolina.

Grosourdy (**2**: 386) describes the wood as strong and resistant, used only for the making of charcoal and for fuel. He gives the specific gravity as 0.505. This author is certainly in error in giving this species the native name of "guamá."

Ink berry. See *Randia aculeata.*

Inodes causiarum. PORTO RICAN HAT PALM. YARAY.

Family Sabalaceae. The most conspicuous difference between the present genus and Sabal is the fact that the former produces an upright trunk while the latter has only what might be called an underground rootstock. Although such a distinction is quite artificial, both groups of species begin life with a creeping axis which becomes erect in one and remains horizontal in the other. A much more important difference is to be found in the leaves which in Inodes have secured strength by the development of a midrib, a tendency early abandoned by Sabal, in which the midrib is rudimentary and the middle of the leaf is the weakest part. The leaves of Sabal are adapted for standing erect, and avoid resistance to the wind by being split down the middle. The leaves of Inodes, which are held horizontal from an erect axis, have attained the unique adaptation of a decurved midrib which braces the sloping sides of the leaf and effectively prevents the breaking above the ligule common in some of the species of Thrinax. It is true that the palm-leaf hats manufactured in large quantities in Porto Rico are made from the present species. The center of the hat industry is at Joyua, a small village on the western coast of the island some miles southwest of Mayaguez and west of Cabo Rojo. Here many hundreds of the palms are growing along the shore in a narrow belt of coral sand.

Ipecac.

See note under *Asclepias curassavica.*

Ipomoea acetosifolia. See *Ipomoea carnosa.*

Ipomoea batatas. SWEET POTATO. BATATA.

In Porto Rico the sweet potato is found in all sorts of places, particularly at low elevations, often appearing quite wild, though in a country where such general and yet desultory agriculture has been carried on it would be very difficult to demonstrate the indigenous character of the plant. It seems, however, that the potato was cultivated in the West Indies before the advent of Europeans, but that does not necessarily involve an indigenous origin, since it was probably already spread throughout tropical America. Moreover, like the cocoanut, it seems to have crossed the Pacific and reached China in the second or third century. Some writers have believed in the Asiatic or Malayan origin of the plant, and have claimed that batata is a Malay name, though this is not the prevailing idea, the present tendency being to consider not only batata but also "camote," the Philippine name as of American origin, and probably introduced from Mexico by the Spaniards.

Little attention is paid in Porto Rico to the planting of pure or high-grade stock, and propagation is carried on exclusively from the vines, pieces a foot long being buried for half their length in the ground. When regular culture is attempted the cuttings are placed a foot apart in rows 2 feet apart. The weeds are sometimes kept down and the rows hilled up, but often neither of these matters is attended to. The crop is not dug at any regular time, but individual roots are discovered by probing and taken out without otherwise disturbing the vine, which is permitted to grow indefinitely.

Numerous varieties are grown in every patch, to judge from the very different leaf forms. The red sorts have lobed leaves, while those of the white kinds (batata blanca) are simply cordate or nearly circular. For good crops rich land is necessary, and the red clay soils seem to be very suitable. Four tons per acre is quoted as a good crop, but a second crop may be secured a month or six weeks later. In the eastern end of the island and in Vieques there is said, for some unexplained reason, to be a scarcity of sweet potatoes, so that with the regular demand a local market is open to those who might undertake this culture on a commercial scale. At the time of our visit retail prices were 3 or 4 centavos per pound in the city markets.

Ipomoea biloba. BEJUCO DE PUERCO DE PLAYA.

(Stahl, 6: 160.)

Ipomoea bona-nox. BEJUCO DE VACA.

An annual ornamental vine growing to great length and bearing many large flowers. Bello gives the name "bejuco de puerco" for *Calonyction megalocarpon.* (Stahl, 6: 148.)

Ipomoea carnea. BATATILLA CARNOSA.

A large vine found along the coast. (Stahl, 6: 277.)

Ipomoea carnosa. BEJUCO DE PUERCO DE COSTA.

A climbing vine growing in the sands along the coast. According to Bello this species is called "batatillo" in the western part of the island. (Stahl, 6: 161.)

Ipomoea cathartica. BEJUCO DE GLORIA.

A vine found in waste places along the coast. (Stahl, 6: 166.)

Ipomoea ciliolata. BEJUCO DE PUERCO BLANCO.

A climber occurring in all parts of the island. (Stahl, 6: 153.)

Ipomoea coccinea. See *Quamoclit coccinea.*

Ipomoea dissecta. NOYO.

A climber, cultivated in gardens; its leaves have an odor of prussic acid. (Stahl, 6: 150.)

Ipomoea fastigiata. BEJUCO DE PUERCO.

A twining vine found in waste places. The tuberous roots are called wild potatoes in Jamaica. (Stahl, 6: 156.)

Ipomoea filiformis. CAMBUTERA DE COSTA.

A much-branched vine found on the coast plains. (Stahl, 6: 163.)

Ipomoea pentaphylla. BATATILLA BLANCA.

A twining climber found in waste places. (Stahl, 6: 151.)

Ipomoea pes-caprae. See *Ipomoea biloba.*

Ipomoea quamoclit. See *Quamoclit quamoclit.*

Ipomoea quinquefolia. BATATILLA BLANCA.

A climber found in the southern part of the island. (Stahl, 6: 153.)

Ipomoea sericantha. BATATILLA DE ZAETA.

A creeping vine, in sands between Vega Baja and Manati. (Stahl, 6: 162.)

Ipomoea setifera. BEJUCO DE PUERCO.

A woody vine found in all parts of the island. (Stahl, 6: 152.)

Ipomoea triloba. BEJUQUILLO DE PUERCO.

A vine 3 to 4 feet (about 1 meter) long, found in hedges, flowering in winter. (Stahl, 6: 157.)

Ipomoea umbellata. AGUINALDO AMARILLO.

A twining vine found in different parts of the island. (Stahl, 6: 159.)

Ipomoea ventricosa. BATATILLA VENTRUDA.

(Stahl, 6: 277.)

Iresine argentata.

Family Amarantaceae; reported from Juya.

Isotoma longiflora. TIBEY BLANCO.

Family Campanulaceae; an herbaceous annual growing in dry, rocky localities. Near Toa Alta this species was called simply "tibey." According to Dr. Stahl, it is reputed to be poisonous, but no direct evidence is given. (Stahl, 6: 27.)

Ixora ferrea. PALO DE HIERRO.

Family Rubiaceae; a tree or shrub 3 meters high, found on mountain slopes and waste places. (Stahl, 5: 63.)

Jaboncilla.

Captain Hansard calls this "soapwort;" specific gravity 0.63. Probably the same as "jaboncillo."

Jaboncillo. See *Sapindus saponaria* and *S. marginalis.*

Jacana. See *Lucuma multiflora.*

A wild tree, 40 feet (12 meters) high, with a trunk 2 feet (60 centimeters) in diameter. Furnishes a rather strong, light-colored, flexible wood, used only for fuel. (Grosourdy, 2: 391).

Specific gravity 0.920. (Exp. 1857.) See also note under *Acana.*

Jacanillo. See *Ardisia pendula.*

Jack plum. See *Syzygium jambolanum*

Jack tree. See *Artocarpus integrifolia.*

Jacquemontia tamnifolia. AGUINALDO PELUDO.

Family Convolvulaceae; a twining herb found in dry places. (Stahl, 6: 171.)

Jacquinia armillaris. BARBASCO.

Family Myrsinaceae: a shrub 3 to 4 meters high; grows along the coast. (Stahl, 4: 40.)

Jacquinia aristata. BARBASCO.

(Stahl, 4: 41.)

Jacquinia berterii.

An indigenous tree of 6 to 8 meters; two subspecies, *portoricensis* and *retusa*, are described by Urban, both known only from the southwestern part of Porto Rico. (Urban, Symb. 1: 378.)

Jacquinia umbellata.

An indigenous shrub, maintained by Urban as distinct from *J. aristata*, to which it was referred by Grisebach, known from Coama, Yauco, Maricao, and from between Sabana Grande and Guanica.

Jagua. See *Genipa americana.*

A tree from all parts of the island; height, 45 to 50 feet (14 to 15 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood white, hard; specific gravity 0.886; used in making packing boxes. (Exp. 1857.)

Captain Hansard gives the specific gravity as 0.80 and says that it is a large tree, yielding good white boards; also a large oval fruit.

Jaguey.

A tree from all parts of the island; height, 40 to 45 feet (14 to 15 meters); diameter, 55 to 60 inches (130 to 150 centimeters). Wood ash-colored, soft; specific gravity, 0.485; used in making fishing canoes. (Exp. 1857.)

In Cuba this name is applied to *Ficus membranacea*, a species not known to occur in Porto Rico.

What is evidently another tree is described by Grosourdy under this name, and also called "mato palo," which see.

Jamaica cherry. See *Ficus pedunculata.*

Jamaica bitterwood. See *Picrasma excelsa.*

Jamaica mignonette tree. See *Lawsonia inermis.*

Jamaica nutmeg. See *Monodora myristica*, the calabash nutmeg.

Jamaica sorrel. See *Hibiscus sabdariffa.*

Jambolin. See *Syzygium jambolanum.*

Jambosa caryophyllus. See *Caryophyllus aromaticus.*

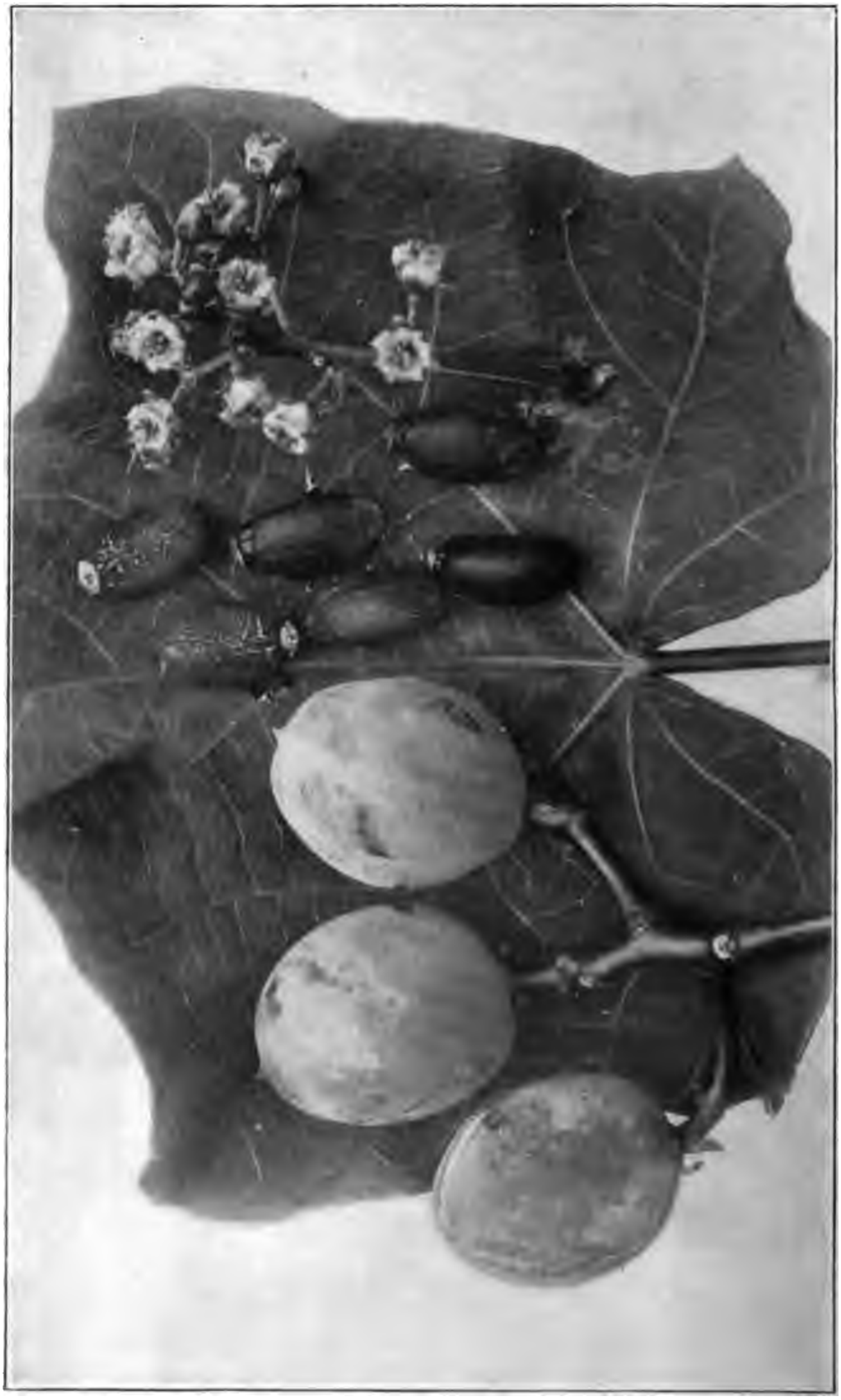
Jambosa jambos. ROSE APPLE. POMA ROSA.

A myrtaceous shrub or small tree native in the Malay region but now introduced in all parts of the Tropics and escaped from cultivation in many countries. In Porto Rico it is abundant in thickets, in waste places, and furnishes the material from which most of the larger baskets are made. Considerable amounts are also used for hoops of the large sugar casks. It yields also an edible fruit which has a pleasant odor like roses, whence the name. The long and narrow leaves resemble those of the peach and oleander. (Stahl, 4: 87, as *Eugenia jambos*).

Grosourdy (2: 409) says that this tree reaches 40 feet in height and that the trunk attains a diameter of 15 to 18 inches. He also states that the wood is used to make charcoal for forges.

Jambosa vulgaris. See *Jambosa jambos.*

PLATE XLII.



PHYSIC NUT (JATROPHA CURCAS). CATAÑO.

Japanese medlar. See *Eriobotrya japonica.*

Jasmin. See *Jasminum pubescens* and *J. officinale.*

Jasmin del rio. See *Cleome spinosa.*

Jasmin hediondo. See *Clerodendron fragrans.*

Jasminum officinale. JASMIN.

Family Oleaceae; a climbing shrub, cultivated in gardens. Introduced from Asia. (Stahl, **6**: 63.)

Jasminum pubescens. JASMIN.

A biennial shrub, introduced from India, and cultivated in gardens. Reported from Sierra de Naguabo and near Rio Blanco, about dwellings; apparently spontaneous. Noted by us at Caguitas and at Juana Diaz. (Stahl, **6**: 62.)

Jatropha curcas. TARTAGO. PLATE XLII.

Family Euphorbiaceae; reported from near Peñuelas. This is a shrub about 8 feet high, and is called "physic nut" in Jamaica, where the seeds are used as a purgative. The juice of the leaves is said to act as a resolvent. The black beans are similar to those of the castor-oil plant; they are ground up, boiled in water, and used as a remedy for diarrhea.

Jatropha gossypifolia. HIGUERETA CIMARRONA.

Occasional as a weed in waste places, particularly in sand banks along water courses. The common name was noted at Coamo Springs, and, doubtless, alludes to the similarity to the castor bean, *Ricinus communis.*

Java plum. See *Syzygium jambolanum.*

Javillo. See *Hura crepitans.*

Jaya.

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood, yellow, hard; specific gravity, 0.778; not used. (Exp. 1857.)

Jerusalem thorn. See *Parkinsonia aculeata.*

Jiba. See *Erythroxylon brevipes* and other species of the same genus.

Jicama. See *Calopogonium caeruleum.*

Jimson weed. See *Datura stramonium.*

Jobo. See *Spondias lutea.*

Job's tears. See *Coix lachryma-jobi.*

Juan caliente. See *Rourea glabra* and *R. frutescens.*

Jucare.

Given by Hill as a variation of the name "ucar."

Juglans cinerea. NUEZ.

A tree growing wild in the interior of the Greater Antilles and on the Continent. It reaches a height of 40 to 45 feet (14 to 15 meters), with a straight, rather long trunk 18 to 24 inches (45 to 60 centimeters) in diameter. Furnishes a good, though rather porous wood, with the properties of the European walnut; is dark red in color, and breaks with a vertical fracture. It is employed for boards and timbers in housebuilding. (Grosourdy, **2**: 403.) See also note under *Nues.*

This species, the common butternut of the United States, is not known to occur in Porto Rico, and this author's identification is probably in error.

Juglans insularis.

According to the Kew Bulletin for 1894, specimens collected by Sintenis near Adjuntas and distributed from Berlin as *Juglans jamaicensis* belongs to *J. insularis*, a species previously known from Cuba.

Juso.

A hard wood with a specific gravity of 1.12; small trees, making good posts. (Hansard.) Probably the same as "huso" or "hueso."

Jussiaea acuminata. See *Jussiaea linifolia.*

Jussiaea hirta. See *Jussiaea peruviana.*

Jussiaea linifolium. YERBA DE CLAVO AGUADA.

Family Onagraceae; a woody, erect plant, growing in hedges and along edges of ponds. (Stahl, 4: 132, as *Jussiaea acuminata.*)

Jussiaea palustris. YERBA DE CLAVO PALUSTRE.

An erect annual, 60 centimeters high, found in inundated plains. (Stahl, 4: 133).

Jussiaea peruviana. YERBA DE CLAVO PELUDA.

An herbaceous, woody annual, found in inundated places; 1 meter high. (Stahl, 4: 134, as *Jussiaea hirta.*)

Jussiaea pilosa.

An erect, woody herb in wet places; the variety *glabra* is known from near Manati.

Jussiaea repens. YERBA DE CLAVO ACUATICO.

A fleshy aquatic herb, sometimes floating, found in marshes. A great variety of medicinal properties are attributed to this by the natives of Jamaica, where it is called "primrose willow." (Stahl, 4: 129.)

Jussiaea suffruticosa. YERBA DE CLAVO.

An herbaceous, woody annual or biennial, common in wet places; 1 meter high; reported from near Manati. (Stahl, 4: 131.)

Kallstroemia maxima.

Family Zygophyllaceae; a leafy herbaceous plant. Secured by Sintenis in cultivated grounds near Manati.

Lablab vulgaris. See *Dolichos lablab.*

Labourdonnaisia albescens. ACANA.

A sapotaceous tree with hard wood.

Lache prieta.

A tree from the interior of the island; height, 25 to 30 feet (8 to 9 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood pink, hard; specific gravity, 0.993; used in building houses. (Exp. 1857.)

Lactuca floridana.

A coarse herbaceous composite collected by Sintenis on a coffee farm near Cayey.

Lactuca intybacea. CHICORIA AZUL.

An erect much-branched annual composite. (Stahl, 5: 155.)

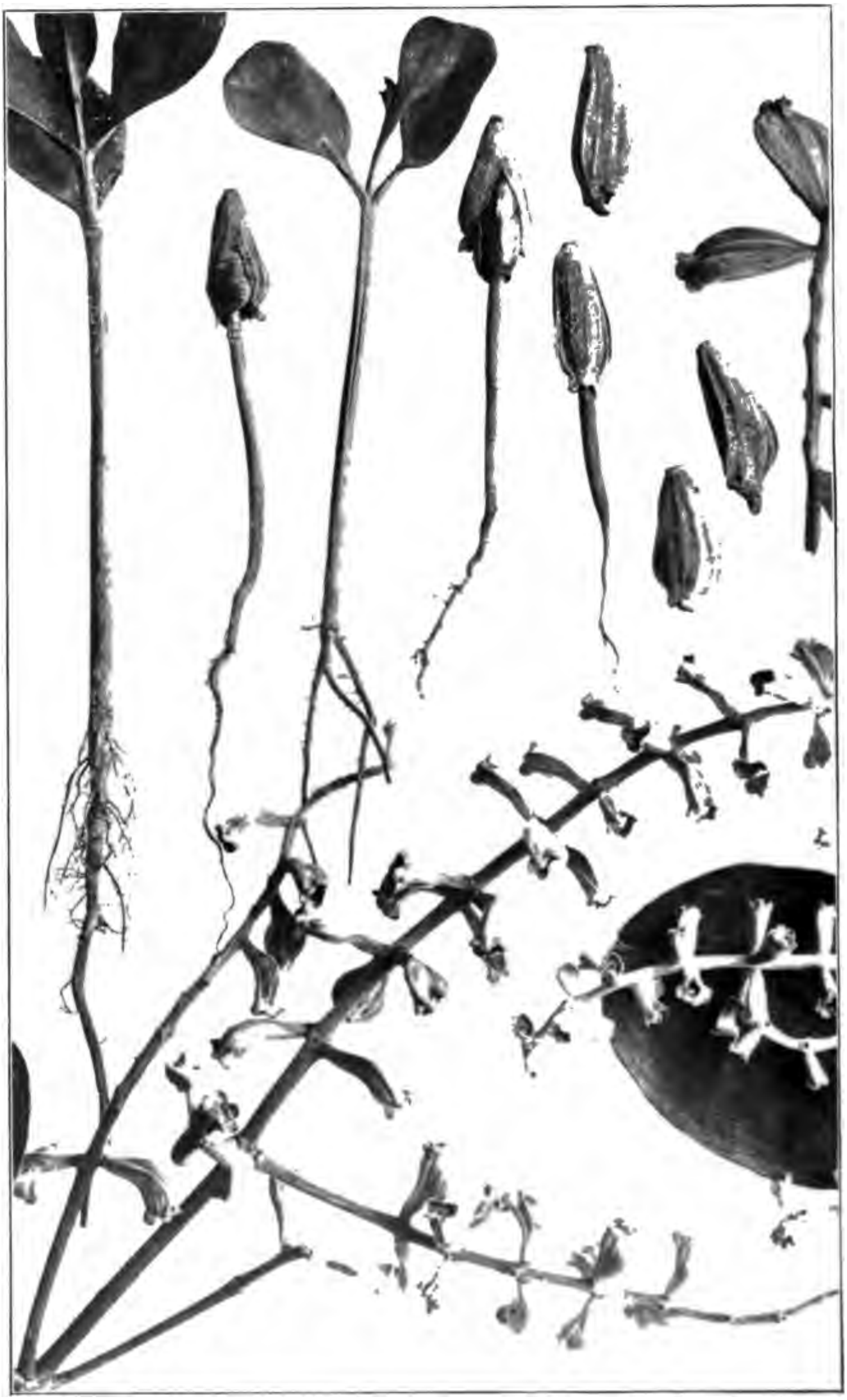
Lactuca sativa. LETTUCE.

The lettuce offered in the markets in Porto Rico seemed to be of fairly good quality; better than could be raised in most tropical countries. Even at sea level, near Santurce, lettuce seemed to thrive moderately well, but it could probably be made to do better in the mountains. The seed is, of course, imported.

Lagenaria vulgaris. GOURD. MARIMBO.

Also called "amargo," "marimbo," and "cadungo amargo." Family Cucurbitaceae. This vine yields the gourds from which the so-called "guira," "guichara" or "caracho" is made. In Cuba the vine is said to be called "guiro cimarron," while "guira cimarrona" is the calabash tree Crescentia.

The young gourds, 6 to 10 inches long, are eaten. Two of the latter size were offered for 10 cents in the San Juan market, June 14.



MANGLE BLANCO (LAGUNCULARIA RACEMOSA); FLOWERS, SEEDS, AND SEEDLINGS.
CATAÑO.

Lagerstroemia indica. ASTROMEDA. CRAPE MYRTLE.

Family Lythraceae; an ornamental shrub, native in China and extensively cultivated in greenhouses in Europe and America, or, southward, in the open air. In the West Indies it is frequent in gardens; reported from Sierra de Luquillo and from Peñuelas, about dwellings.

Lagerstroemia reginae.

An East Indian tree valued for its timber, which is extremely durable in water. Introduced into Jamaica according to Grisebach.

Laguncularia racemosa. MANGLE BLANCO. PLATE XLIII.

Family Combretaceae; a shrub or tree 5 to 8 meters high; grows in tide-water swamps and is often mistaken for the true mangrove, Rhizophora. It is abundant immediately behind Cataño. (Stahl, **4**: 136.)

Lancewood.

A name applied in the British West Indies to species of Oxandra and Cananga.

Lantana camara. CARIAQUILLO.

Family Verbenaceae; a spiny shrub, 1 meter high. found in rocky places: reported from Guanica, Yauco, and Mayagnez. (Stahl, **6**: 214.)

Lantana crocea. CARIAQUILLO.

A shrub slightly longer than *L. camara.* (Stahl, **6**: 215.)

Lantana involucrata. CARIAQUILLO DE SANTA MARIA.

A shrub, 1 meter high, found in waste places; flowers fragrant. At Cataño this is called simply "Santa Maria." (Stahl, **6**: 215.)

Lasianthus lanceolatus. AROMA.

Also called "bejuco de peo" and "mata de peo." A rubiaceous shrub from the eastern and southern parts of the island. (Urban, Symb. **1**: 449.)

Lasianthus moralesii.

Family Rubiaceae; reported from Naguabo.

Laugeria resinosa. AQUILON.

Family Rubiaceae; a shrub, 8 feet (2.5 meters) high, on mountains.

Laurel amarillo.

Perhaps the same as "laurel sabino." The wood is yellow, makes good boards, stands water well, and is pretty for furniture; specific gravity, 0.96. (Hansard.)

Laurel blanco.

A tree from all parts of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 20 to 25 inches (50 to 62 centimeters); wood, white, hard; specific gravity, 0.606; used in building houses. (Exp. 1857.)

Captain Hansard gives a specific gravity of 0.84 and says it is a white wood used for furniture.

Grosourdy (**2**: 393) includes both "laurel prieto" and "laurel blanco" under the following description:

A wild tree, 60 to 80 feet (18 to 24 meters) high, with a long, straight trunk 6 to 8 inches (15 to 20 centimeters) in diameter. It furnishes a wood very strong and resistant, rather light, fibrous in texture, neither hard nor flexible, and moderately fine-grained. The wood exhales an agreeable aromatic odor. The color is a grayish yellow or very light cinnamon. Specific gravity, 0.658. Used on the continent to make umbrellas and in building boats. It is also suitable for doors, windows, etc.

Laurel prieto.

A tree from all parts of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 20 to 25 inches (50 to 62 centimeters); wood, dark, hard; specific gravity, 0.572; used in building houses. (Exp. 1857.) (See also *Laurel blanco.*)

Laurel puero.

A tree from all parts of the island; height, 45 to 50 feet (14 to 15 meters); diameter, 20 to 25 inches (50 to 62 centimeters); wood, yellowish, hard; specific gravity, 0.628; used in building houses. Also called "azafran." (Exp. 1857.)

Perhaps this should be "laurel puerco."

Laurel sabino. See *Magnolia splendens;* also *Talauma.*

Color, clear olive-brown. Ducts occurring singly, evenly diffused in one or two irregular lines, between the indistinct medullary rays. A straight-grained wood similar in color to, but finer-grained than the heart of the tulip and cucumber tree of the United States. (Hill and Sudworth, p. 28.)

Laurel savino.

A tree from all parts of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood, greenish, hard; specific gravity, 0.750; used in building houses. Probably another name for "laurel sabino." (Exp. 1857.)

Lawsonia alba. See *Lawsonia inermis.*

(Stahl, 4: 122.)

Lawsonia inermis. HENNA. RESEDA.

Family Lythraceae: a glabrous shrub, 2 meters high, with white flowers; naturalized from Egypt and Syria in Jamaica and Antigua. Yields a yellow dye, much used by the Egyptians and Arabs as a cosmetic for the palms of the hands, finger nails, and hair, also for the tails of horses, and for coloring cloth a dull red. "Egyptian privet" and "Jamaica mignonette tree" are additional names. Cultivated in gardens in Porto Rico. Specimens have been collected near Guanica. It will grow without irrigation in extremely dry situations and has been suggested as a hedge plant. (Stahl, 4: 122, as *L. alba.*)

Lechecillo. See *Chrysophyllum glabrum.*

A wild tree, 40 feet (12 meters) high, with edible fruit. The trunk 12 inches (30 centimeters) in diameter. The wood is rose-colored, hard, and breaks with a vertical fracture. Its common use is for shelving in houses. It is used also for making a fine charcoal for forges. (Grosourdy, 2: 394.) Specific gravity, 0.883. (Exp. 1857.)

Leche prieta.

A wild tree from the interior of the island, 20 feet (6 meters) high, with a trunk 27 inches (67 centimeters) in diameter. It furnishes a compact, rose-colored wood that is very difficult to break. Its common use is for shelving in houses. (Grosourdy, 2: 394.)

Lechicillo.

Probably another spelling of "lechecillo."

A small tree, abundant on mountain slopes near streams. The fruit is eaten by the natives, while the wood is very soft and not used. The specific gravity, according to Captain Hansard, is 0.79.

Lechoncillo.

Captain Hansard gives this wood a specific gravity of 0.80. It is probably the same as lechicillo.

Lechosa. See *Carica papaya.*

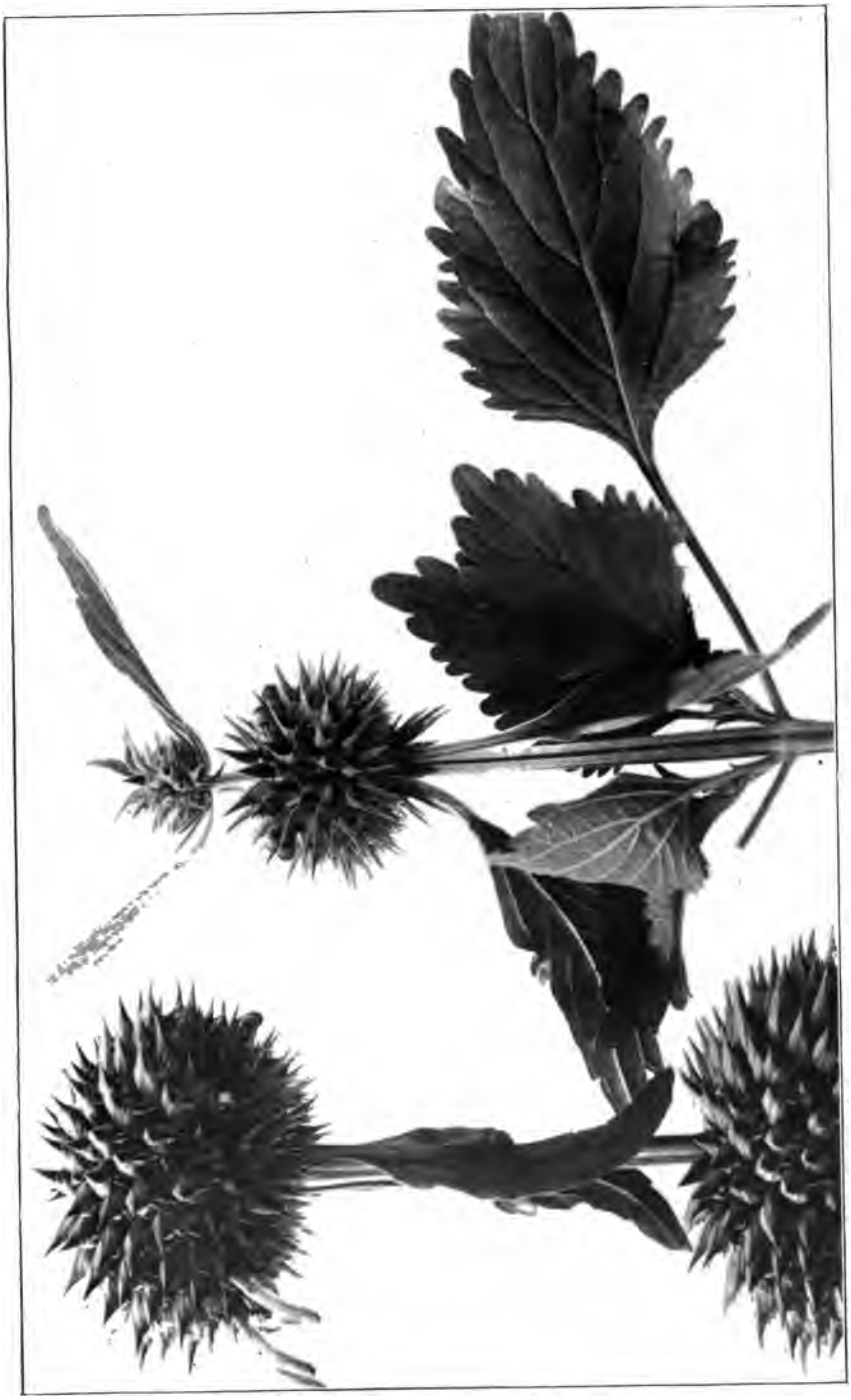
Lemon. See *Citrus limonum.*

Longua de vaca. See *Elephantopus scaber* and *Sansericria* sp.

Loonotis nopetaefolia. MOLINILLO. PLATE XLIV.

A herbaceous annual of the mint family, 15 to 30 inches (37 to 75 centimeters) high: the large bur-like flower clusters are very peculiar, and when covered with

PLATE XLIV.



MOLINILLO (LEONOTIS NEPETAEFOLIA).

where all grasses or other plants tried for this purpose have failed. In Porto Rico coarse grasses, such as "guinea" and "para" grass, are abundant, but lawns are uncommon, and perhaps Lippia may be found of use. Mr. Fairchild's report on the subject is accordingly added:

> According to Ascherson and Schweinfurth the Lippia is a native of Egypt. It has probably been used for lawn purposes for a great many years.
>
> It is a low, creeping plant of the Verbena family, with broad, flat, obovate leaves of a deep green color. The creeping stems throw out roots wherever they come in contact with the earth, and form thick mats of herbage. It is well known that in regions with climatic conditions similar to those of Egypt, grass lawns are generally very difficult to maintain. Although there are several substitutes for lawn grasses, none that I have seen are as good as Lippia. Owing to its rapid growth, the plant can be mown closely, and to a layman the lawn effects resemble closely those produced by English lawn grasses.
>
> In order to plant a lawn with Lippia the ground is prepared as it would be for the reception of grass seed. A mass of old Lippia is dug from some neighboring lawn or field. The native gardener cuts off or breaks off two or three long cuttings of the plant, makes a hole with a pointed stick in the soft earth, thrusts the cuttings, doubled up, into the hole and packs the earth securely about them. These cuttings are placed about 4 to 6 inches apart, quite irregularly over the field. They are given plenty of water, being sprinkled every day until well started. In winter, in Egypt, the lawns made of this Lippia are watered every four to five days, while in summer they are kept green by daily waterings. Every twenty days the lawns are gone over with a scythe, and in this way kept quite closely mown. There is no evident reason why a lawn mower would not answer the purpose better than a scythe.
>
> Lawns of Lippia will last five to six years without renewing. Whenever a patch gets old or is injured by the shade of some tree, it is very easily repaired by setting new cuttings.
>
> While, according to the statement of Mr. Colombo, of the Gizeh Gardens, no grasses form in Cairo a real sod, this plant produces a permanent sod lasting five to six years.
>
> The Lippia deserves a thorough trial as a lawn plant in Southern California, Arizona, Texas, and Florida. Just what degree of hardiness it will show remains to be seen. It is not exposed to a temperature below freezing here in Cairo, except at extremely long intervals. Whether it is injured then or not I have been unable to ascertain. Although, during the hottest part of the summer, the lawns of Lippia wear a much less vigorous look than they do in winter, yet, from the fact that they are able to withstand the extreme heat and dryness of the Egyptian summer, it is evident that the plant is well suited for hot, dry climates. It is to be hoped this will prove a valuable new lawn plant for the parks and gardens of the South.
>
> It is well to note that this plant is already quite commonly introduced, especially in the Southern States. It occurs in low, moist situations, from North Carolina to Florida, Texas, and Missouri, and is also present in California. So far as known it has not been utilized as a lawn plant in this country, although it is recognized as having some value as a sand-binder on the South Atlantic and Gulf coasts.

Lippia reptans. CIDRON.

(Stahl **6**: 210.)

Licorice weed. See *Scoparia dulcis.*

Lira. See *Hibiscus schizopetalus.*

Litchi. See *Litchi chinensis.*

Litchi chinensis. LITCHI.

An important fruit in Southern China, British India, and the Malay Peninsula. The tree is described as a handsome evergreen, and, although it can be successfully propagated only by layering, it is reasonably hardy when once established. Writing from the standpoint of the northwest provinces of India, Dr. Bonavia, the fruit expert, says:

> Here, then, is a fruit tree which resists the heaviest rains and stands the hottest winds, and also the frosts of these provinces. Moreover, it bears annually an abundant crop of fine, well-flavored, and aromatic fruit, which can readily be sent to distant markets without injury. Instead of being planted by the one or two,

> it should be planted by the thousand. From all I know of the hardiness and fruitfulness of this remarkable tree, I feel confident that if any individual (or company), possessing the necessary capital, were to plant an extensive orchard of litchi trees, say where canal water would be easily obtained, or where well water is within easy reach, he would very probably make a good life-long business of it.

On this testimony the editor of Watt's Dictionary of the Economic Products of India comments as follows:

> This result has been abundantly attained in Bengal, and, although statistics of the extent of the trade can not be given, it may be said that in the lower provinces the litchi tree is almost coextensively cultivated with the mango. It comes into season a little before that fruit, and in the larger cities, such as Calcutta, is sold in every fruit dealer's shop, the streets for a month or six weeks being literally bestrewn with the rind and large seeds, rejected by the wayside consumers. The fruit, to be enjoyed, should, however, be eaten as soon after being plucked as possible. When fresh the great bunches look like bright, pinkish strawberries, but they rapidly lose their bloom and assume a dirty, brownish color. The dried fruit, as sold in Europe, bears no possible resemblance to the deliciously bittersweet pulp of the fresh litchi.
>
> The fruit is nearly round, and about an inch and a half (37 millimeters) in diameter. The edible portion is the sweet, semitransparent, jelly-like pulp or aril which covers the seed, and the whole is inclosed in a thin reddish or brownish brittle shell, which is rough with warty protuberances. The Chinese dry the fruit, which then becomes blackish, and in this state it may often be seen in London fruit shops. The fresh fruit has a very pleasant acid flavor, and is much liked both by natives and Europeans in this country.

With such definite and authoritative commendation, it would seem that the litchi is one of the fruits most likely to succeed in Porto Rico and likely to be of value when once generally introduced. The difficulty of propagation by cuttings is of course an obstacle, but it could easily be obviated by a few enterprising nurserymen. Little seems to have been written on the results of experiments which have been made with this tree in other West Indian Islands. The name "lichi" is mentioned in Maza's Diccionario of Cuban common names, and the species has also been recorded among the plants growing in the Castleton Gardens in Jamaica, but nothing has been found to indicate that any attempt has been made at extensive propagation for general purposes. Quite a large specimen of this species exists in one of the greenhouses of the Department of Agriculture.

The dried fruits described above are an article of considerable importance among the Chinese in this country, and are served in most of the Chinese restaurants. Boxes containing about a quart of these dried fruits were selling in one of the Washington fruit stores at 50 cents apiece.

Although these may bear no resemblance to the fresh fruit, they are by no means unpalatable. In appearance and taste they are not unlike raisins.

Llagrume. See *Didymopanax morototoni.*

Llanten. See *Plantago major.*

Llume. See *Aeria attenuata.*

Lluvia. See *Duranta plumieri* and *Russellia juncea.*

Lobelia.

Family Campanulaceae; a species of Lobelia is reported by Hill in a list of trees of the mountains. The species known from Porto Rico are all herbs except *L. acuminata* (*Tupa acuminata*), which grows to a height of about 10 feet.

Lobelia acuminata. TIBEY. TUPA.

A shrub 2 meters high, found in waste places and on limestone mountains. (Stahl, **6**: 29, as *Tupa acuminata.*)

Lobelia assurgens. CHICORIA CIMARRONA.

An herbaceous perennial, 3 to 4 feet (about 1 meter) high, growing on mountains. Urban treats *Tupa assurgens* of Grisebach and Stahl as variety *portoricensis* under *Lobelia assurgens.* (Urban, Symb. **1**: 454.)

Lobelia cliffortiana. CARDENALA AZUL.

An herbaceous, erect annual, found in rocky places. (Stahl, **6**: 28.)

Lobelia portoricensis.

A shrub, 2 to 8 meters in height; known from Luquillo and Adjuntas. (Urban, Symb. **1**: 453.)

Locust tree. See *Hymenaea courbaril.*

Logwood. See *Haematoxylon campechianum.*

Lombricera. See *Spigelia anthelmia.*

Lonchocarpus glaucifolius. GENO.

A leguminous tree of 5 to 8 meters, known only from Porto Rico, Rincon, Aguada, Aguadilla, and Quebradillas. A specimen from Aguada shows elliptical, finely veined leaves and flat, bright russet pods. (Urban, Symb. **1**: 326.)

Lonchocarpus latifolius. PALO HEDIONDO.

A tree, 10 meters high, along the coast. Hard wood, used for furniture. Reported from Manati and from Bayamon as "palo seco." (Stahl, **3**: 91.)

Lonchocarpus violaceus. GENO GENO.

A tree or shrub, 5 meters high, found on the west coast. (Stahl, **3**: 92.)

Lonicera. HONEYSUCKLE.

One or more species are cultivated in gardens.

Loniciera. See *Linociera* and *Mayepea.*

Loquat. See *Eriobotrya japonica.*

Loranthus americanus. HICAQUILLO.

Reported by Bello. Urban describes this as a new species, *Dendropremon bicolor.*

Loranthus portoricensis. See note under *Psychotria pendula.*

Lucuma mammosa. SAPOTE. MAMEY SAPOTE.

Family Sapotaceae; a tree, 10 meters high; yields the "marmalade fruit;" also called the "vegetable egg." Grisebach spells the native name "*mammee sapota.*" (Stahl, **6**: 51.)

Grosourdy (**2**: 398) says of the wood that it is fine-grained and compact, ordinarily hard, and of good weight. In color it resembles mahogany, but is redder and more uniform, though somewhat mottled with darker-colored spots. Specific gravity, 0.588. Its most common use is for shelving, but it would appear suitable for carpentry and cabinetwork. The fresh bark has the odor of bitter almonds.

This fruit is rare in Porto Rico, and the plant is probably introduced. The common names are, however, often incorrectly applied to the fruit of *Mammea americana*, which it somewhat resembles in external appearance. The smooth seeds with a roughened segment are, however, entirely unlike those of the latter species, which are rough over the entire surface, with the flesh closely adhering. In Central America and Mexico this is a very common wild fruit, and in times of want it serves to some extent as a food. The flavor is mild, by some considered insipid, and it will probably never become popular among people of temperate regions.

As the common name "marmalade fruit" implies, it is made into a marmalade, and this is not unlike good apple butter.

It was this fruit that kept Cortez and his army alive on their famous march from Mexico City to Honduras.

Lucuma multiflora. JACANA.

A large tree, 8 to 10 meters high, yielding a useful wood. Bello gives the common name as "hacana." (Stahl, **6**: 50.)

Lucuma stahliana.

Reported from near Manati.

Lucuma urbani.
Reported from near Guanica.

Luffa acutangula. SPONGE CUCUMBER. ESPONJA.
Reported by Bello; also called "estropajo." A species of Luffa, probably this or *L. aegyptiaca*, was very common in Porto Rico, climbing over bushes and fences. It is not known whether the matted fibers of the fruit are used or not, but its increasing employment for the toilet and for other purposes, such as the linings of hats and the porous soles of slippers, is rendering it quite an article of export from Japan. In the younger state the fruits may be eaten as cucumbers or pickled.

Luffa cylindrica. See *Luffa aegyptiaca.*

Lycopersicon cerasiforme. TOMATO AMARILLO.
Family Solanaceae.

Lycopersicon esculentum. See *Lycopersicon lycopersicum.*
(Stahl, **6**: 126.)

Lycopersicon humboldtii. TOMATE.
(Stahl, **6**: 125.)

Lycopersicon lycopersicum. TOMATO. TOMATO GRANDE.
Tomatoes, like many other vegetables that have been developed in temperate regions, are with difficulty made to succeed in the Tropics. Good tomatoes are, however, produced in Porto Rico, and with the use of fertilizers fruits are reported from the north side of the island weighing as high as 11 ounces.

Maba inconstans. NEGRA LORA.
Family Ebenaceae. (Stahl, **6**: 60.)

Maba sintenisii. TABEIBA.
Also called "guayabota níspero;" a native forest tree, about 30 feet (9 meters) high, reported from the vicinity of Lares. (Urban, Add. **1**: 43.)

Mabi. See *Colubrina reclinata* and *C. ferruginosa.*
A drink by this name is commonly sold in the markets and peddled on the streets. It is usually taken as a "refresco," and is also reputed to be a remedy for indigestion. The bark from which it is made is also offered in the markets.

Mabie. See *Colubrina reclinata.*
Said to be the St. Lucia form of the word "mabi."

Macachaira. See *Manihot palmata.*

Macaw bush. See *Solanum mammosum.*

Macaw palm. See *Acrocomia fusiformis.*
According to Grisebach the "mackaw tree" is *Acrocomia sclerocarpa* (=*A. aculeata*), while the "great mackaw tree" is *A. lasiospatha* (=*A. fusiformis*).

Maclura tinctoria. See *Chlorophora tinctoria.*

Madre de cacao. See *Erythrina umbrosa.*
This name is not known to be used in Porto Rico, but is of South American origin, and has been referred to by Hill and other writers.

Maga. See *Thespesia grandiflora.*
A tree from the interior of the island; height, 45 to 50 feet (14 to 15 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood light, hard; specific gravity, 0.972; used in building houses. (Exp. 1857.)

Color, rich chocolate brown. Conspicuous ducts few, occurring singly, and irregularly scattered between the medullary rays; mostly distinct or occasionally two or three loosely grouped. Medullary rays comparatively few, distinct, but inconspicuous. Wood fibers slightly cross-grained, the smoothed surface appearing straight-grained. Quarter and radially cut medullary rays have a satiny appearance. The rich color and attractive grain of this wood should make it valuable for cabinetwork. (Hill and Sudworth.)

This name is also given by Hill among those of trees planted for shading coffee. We could not learn that the magar is ever so used; perhaps an error for "moca."

Magar. See *Thespesia grandiflora.*

Magnolia. See *Talauma plumieri.*

Magnolia portoricensis. Mauricio.

A handsome indigenous tree discovered by Bello, differing from *M. splendens* in having much broader and more rounded leaves. It is known only from the western half of the island—Utuado, Jayuya, Adjuntas, Guayanilla, Peñuelas, and Lares. (Urban, Symb. 1: 306).

Magnolia splendens. Sabino.

Also called "laurel sabino." A species recently described by Urban from the primeval forests of the Sierra de Luquillo and Sierra de Naguabo. Said to be one of the most beautiful species, similar in habit to *Talauma plumieri*, for which it was probably mistaken by Eggers in the account of his visit to Porto Rico, as quoted from Nature by Hill. The leaves are said to be used by the natives as a condiment, like those of *Laurus nobilis* of Europe.

Mago.

A tree found in all parts of the island; height, 30 to 40 feet (9 to 12 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood pinkish, soft; specific gravity, 0.791; not used. (Exp. 1857.)

Mahagüa. See *Paritium tiliaceum.*

An erroneous spelling of "majagua."

Mahoe.

A name applied in the British West Indies to various malvaceous trees, such as Paritium, Hibiscus, and Thespesia.

Mahogany. See *Swietenia mahagoni.*

Mais, Maize. See *Zea mays.*

Majagua. See *Paritium tiliaceum.*

A soft wood, used for laths in hut building, the bark used for fastening. All ropes made here are from the majagua bark. (Hansard.)

Majagua quemona. See *Pisonia obtusata.*

Malachra alceifolia.

Family Malvaceae; variety *rotundifolia* reported from near Aibonito, along roads.

Malachra capitata. Malva de caballo.

An herbaceous annual, becoming woody with age.

Commonly seen about dwellings and moist places. A characteristic species with light-yellow flowers. We found it cultivated in a dooryard near Coamo, where a decoction was supposed to have medicinal properties in external application. In this locality the plant was known simply as "malva," as also stated by Bello. (Stahl, 2: 74.)

Malachra ciliata. See *Malachra urens.*

Malachra cordata. Malva acorazonada.

Family Malvaceae. (Stahl, 2: 77.)

Malachra palmata. Malva de caballo.

An herbaceous annual, found in all parts of the island. (Stahl, 2: 76.)

Malachra radiata. Malva blanca.

A woody, annual herb, 1 meter high, found in stony places. (Stahl, 2: 75.)

Malachra urens. MALVA PESTAÑOSA.
(Stahl, 2: 77, as *Malachra ciliata.*)

Malagueta. See *Amomis caryophyllata.*

Malanea macrophylla. PALO LLORON.
Family Rubiaceae; a shrub 1 meter high, found among brambles. (Stahl, 5: 93.)

Malojillo. See *Panicum molle.*
In Cuba the present name does not appear to be used; Mazo gives "yerba para," "yerba del para," "yerba del paral," and "yerba de rarana."

Malonillo. See *Poinciana regia.*
According to Captain Hansard this name is extensively used in the northeastern part of the island instead of "flamboyant."

Malpighia coccigera. AZOTA-CABALLO.
A shrub 3 to 4 meters high; cultivated for its agreeable fruits, which resemble the common cherry and make good tarts and jelly. (Stahl, 2: 143.)

Malpighia urens. PALO BRONCO.
A shrub 4 meters high, along the seacoast; fruit and bark are used as astringents. The hairs on the under side of the leaves pierce the skin and cause severe pain. (Stahl, 2: 144.)

Malta arborea.
A tree from the northern part of the island; height, 12 to 15 feet (4 to 5 meters): diameter, 8 to 9 inches (20 to 22 centimeters). Wood light, very hard; specific gravity, 0.977; fruit tree. (Exp. 1857.)

Malta de mata.
A tree from the northern part of the island; height, 8 to 10 feet (2.5 to 3 meters); diameter, 4 to 6 inches (10 to 15 centimeters). Wood light, very hard; specific gravity, 0.890; fruit tree. (Exp. 1857.)

Maluco. See *Spilanthes acmella.*

Malva. See *Malachra capitata.*
A root called malva was being sold by an herb dealer in the market of Ponce as a remedy for pulmonary diseases.

Malva acorazonada. See *Malachra cordata.*

Malvabisco. A form of the name "malvavisco."

Malva blanca. See *Malachra radiata.*

Malva de caballo. See *Malachra capitata* and *M. palmata.*

Malva pestañosa. See *Malachra urens.*

Malvastrum spicatum. MALVAVISCO.
Family Malvaceae; a woody herb, found on south coast: rare on the north coast. (Stahl, 2: 78.)

Malva té. See *Corchorus hirtus* and *C. siliquosus.*

Malva té de la playa. See *Corchorus hirsutus.*

Malvavisco. See *Malvastrum spicatum.*

Malvavisco afelpado. See *Hibiscus tomentosus.*

Malvavisco cimarron. See *Abutilon umbellatum.*

Malvavisco purpureo. See *Hibiscus phoeniceus.*

Mamey. See *Mammea americana.*
A tree from all parts of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood pinkish, hard; specific gravity, 0.978; fruit tree. (Exp. 1857.) The gum is used as incense.

Mamey del cura. See *Ternstroemia elliptica* and *T. stahlii.*

Mamey sapote. See *Lucuma mammosa.*

Mameyuelo. See *Ardisia coriacea*, *A. glauciflora*, and *A. purpurascens.*

A tree from all parts of the island; height, from 40 to 45 feet (13 to 14 meters); diameter, 9 to 10 inches (23 to 25 centimeters). Wood white, hard; specific gravity, 0.879; used in building houses and cabinetmaking. (Exp. 1857.)

Mamie apple. See *Mammea americana.*

Mammea americana. MAMMEE. MAMEY. MAMIE APPLE.

Family Clusiaceae; a handsome tree, 40 to 60 feet (12 to 18 meters) high; fruit large, with a pleasant taste and aromatic smell, eaten raw or preserved in sugar. Wood valued for timber; gum used by natives in extracting chigoes, etc. (Lunan.)

From between Fajardo and Ceiba. (Stahl, **2**: 124.)

See note under *Lucuma mammosa.*

Mammee. See *Mammea americana.*

Mammee apple. See *Mammea americana.*

Mammee sapota. See *Lucuma mammosa.*

Mamoncillo. See *Melicocca bijuga.*

Manchineel. See *Hippomane mancinella.*

Mandioca. See *Manihot.*

Mangifera indica. MANGO.

Family Anacardiaceae; a fruit tree native in South Asia or the Malay Archipelago and introduced into America about the beginning of the eighteenth century.

It not infrequently happens that those who are visiting a tropical country for the first time confuse the mangrove and the mango. The former is a tree which forms tide-water swamps along the coasts and about the mouths of rivers in nearly all humid tropical countries, while the mango is an edible fruit, even more widely distributed.

In Porto Rico the name mangrove or "mangle" is applied to three or four different trees which grow in the coast swamps, while the mango is the best known and most abundant of fruits. Whether associated with ideas of unwholesomeness through the above confusion or other unreliable information, many of the army officers in Cuba and Porto Rico manifested a violent prejudice against the mango, and some even issued orders strictly forbidding the soldiers, under any circumstances, to eat it. The antimango crusade has even gone to the extent of cutting down mango trees in public grounds.

The only excuse for this mistaken policy seems to lie in the report that many soldiers were made sick by them when the armies were first landed, and this on being sifted a little resolves itself into the proposition that a hearty meal of green mangoes, followed by a large quantity of bad rum, made the hungry and fatigued soldiers very sick. Before the mango is finally condemned it might be well to consider what the results would have been with green apples.

In reality the mango is known throughout the Tropics as a delicious and wholesome fruit, comparable in quality and value with the apple or the orange, although entirely different from either in texture and flavor. Some varieties have, especially when unripe, a distinct flavor and odor of turpentine, which seems objectionable at first, but soon comes to add charm to the high qualities of the new favorite. It has been said that one should eat mangoes only in a bath tub, on account of keeping the yellowish pulp from spreading over the countenance and person, and this might prevent the fruit becoming popular with the most fastidious. This objection, however, applies only to the poorer varieties, such as at present exist in

Porto Rico. The finer, asexually propagated varieties are quite as manageable as the peaches and pears of our own climate.

Several of the best Indian varieties have already been introduced into Florida and the West Indies, and when these are produced in sufficient quantities to be placed regularly in the Northern markets the mango is almost sure to become a popular fruit.

The drier portions of Porto Rico are admirably adapted for growing mangoes, and the absence of all danger from frost places this island at a decided advantage over Florida, where the best varieties are now being propagated on an extensive scale by several of the more enterprising fruit growers. It has been found possible to ship even the better varieties from India to London, consequently there need be no fear as to the shipping qualities.

For a discussion of the possibilities and requirements of the mango in Porto Rico, see Bulletin 28, Bureau of Plant Industry, U. S. Department of Agriculture.

The wood is light, soft, fibrous in texture, and not very compact, brownish gray with little spots and irregular lines of brown. After varnishing this wood resembles light-colored walnut. It is resistant and elastic, and is used for the same purposes as the ash of Europe—for gunstocks, etc. It is not, however, used as much as it deserves. Specific gravity, 0.864. (Grosourdy, **2**: 400.) Specific gravity also given as 0.738. (Exp. 1857.)

Mangle blanco. See *Avicennia nitida* and *Laguncularia racemosa.*

Grosourdy (**2**: 399) gives this common name to both *Avicennia tomentosa* (=*A. officinalis*) and *Laguncularia racemosa*, and describes the wood as being hard and heavy, fibrous and compact in texture, and gray in color with rather brown undulations, which produce a very pleasing aspect. Used for the small timbers of houses, but its most common use is in making a good charcoal and for fuel. The specific gravity of Avicennia is 0.867; of Laguncularia, 0.860.

Mangle bobo.

A tree from near the seashore; height, 25 to 30 feet (8 to 9 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood, dark, hard; specific gravity, 1.124; used for cabinetwork. Also called "mangle prieto." (Exp. 1857.)

A good firewood; on the higher elevations of El Yunque this grows as mere saplings, while in the lowlands it reaches 8 or 10 inches (20 to 25 centimeters) in diameter. (Hansard.)

Bello gives this common name with *Avicennia nitida*, but this is certainly not the tree reported by Captain Hansard.

Mangle botanico.

A tree from the beaches of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood, silver-gray, hard; specific gravity, 1.072; used in making knees of boats. (Exp. 1857.)

Mangle boton. See *Conocarpus erectus.*

Mangle cobo.

A tree from the beaches of the island; height, 18 to 20 feet (5.5 to 6.5 meters); diameter, 9 to 10 inches (22 to 25 centimeters). Wood, white, soft; specific gravity, 0.840; not used. (Exp. 1857.)

Mangle colorado. See *Rhizophora mangle.*

A tree from the beaches of the island; height, 18 to 20 feet (5.5 to 6.5 meters); diameter, 9 to 10 inches (22 to 25 centimeters). Wood, pinkish, hard; specific gravity, 0.752; bark used in tanning leather. (Exp. 1857.)

Mangle prieto.

A tree from the beaches of the island; height, 25 to 30 feet (8 or 9 meters); diameter, 10 to 12 inches (22 to 25 centimeters). Wood, dark, hard; specific gravity, 1.124; used for cabinetwork. Also called "mangle bobo." (Exp. 1857.)

Mango. See *Mangifera indica.*

Mangrove. See *Rhizophora mangle.*

Mangrove, Black. See *Avicennia nitida.*

Mangrove, Olive. See *Avicennia nitida.*

Mangrove, White. See *Laguncularia racemosa* and *Avicennia nitida.*

Maní. See *Arachis hypogaea.*

Manihot aipi.

Considered as a variety of *Manihot palmata.*

Manihot cassava. CASSADA. YUCCA.

Family Euphorbiaceae: shrubby plants, 6 to 8 feet (1 to 1.5 meters) high: cultivated for the thick, fleshy roots, which are very rich in starch.

Cassava is a less important article of food in Porto Rico than in most other parts of the American tropics. Its place is to a great extent taken by "yautia" and "taro." The principal uses to which cassava is put in Porto Rico are the making of starch and a sort of bread baked in thin, semicircular loaves or cakes. This latter custom is undoubtedly indigenous, and curiously enough finds its counterpart among the so-called Caribs of Guatemala, a negro people of uncertain origin, with whom cassava is by far the most important food.

Forms with both 5 and 7 leaflets were observed, and it was inferred that both the sweet and the bitter varieties exist, although nothing was heard of the poisonous properties of any of the cassava grown in the island, but as none is eaten raw or used as fodder, such might easily exist and fail to be in evidence.

Captain Hansard's notes on culture are as follows: "Hot climate, coast region: plow the soil; cut stem in 6-inch lengths; plant 5 feet apart, leaving about 1 inch out of the ground; plant on a dry day. It will begin to grow in two weeks, and in three months will cover the ground. Will be ready to dig in nine months. Spoils quickly out of the ground, but keeps until dug. To prepare meal, tubers are pulled, washed, grated, put in bags, and the juice pressed out. The fibers are sifted out and the meal dried by a fire, but should not be scorched. Proper drying and heating draws off the juice."

Manihot palmata aipi. SWEET CASSAVA. YUCA.

According to Engler and Prantl *M. palmata aipi* in Brazil is called "aipim," "macacheira," or "sweet mandioca."

Sweet cassava, as a fodder crop, has received considerable attention, but in Florida, where the most extensive experiments have been tried, velvet beans have been found to produce cheaper fodder with less labor, and with the added advantage that the soil is thereby enriched.

As a starch producer the outlook is perhaps more promising, cassava starch being of a very fine quality. Several factories are in operation in Florida, but it is still too early to report on the success of the enterprise.

Manihot utilissima. CASSAVA. YUCA.

This is the so-called "bitter cassava," and usually contains sufficient hydrocyanic acid in the roots to render them poisonous if eaten before taking precautions to remove or destroy it. This can be accomplished by cooking or by expressing the juice, after which it is a very wholesome food.

Cassareep is the juice of this plant boiled down to a gummy consistency. It is used in the British West Indies to preserve fresh meat or in the dish called "pepper pot." It is also exported to England for making sauce.

An antidote used by the Indians for the poison of this plant consists of red peppers steeped in pure rum.

Manioc. See *Manihot.*

Manzanilla.

A name in use for several composite weeds, the most common of which is *Bidens leucantha*. Stahl proposes to distinguish the different species according to the following list:

Manzanilla cimarrona. See *Stemmodontia carnosa* and *Bidens leucantha*

Manzanilla de costa. See *Stemmodontia buphthalmoides*.

Manzanilla de la playa. See *Stemmodontia carnosa*.

Manzanilla de monte. See *Stemmodontia reticulata*.

Manzanilla del pais. See *Bidens pilosa*.

Manzanilla negra. See *Bidens bipinnata*.

Manzanilla trepadora. See *Bidens rubifolia*.

Manzanillo. See *Hippomane mancinella*.

Mapola. See *Hibiscus rosa-sinensis*.

In the Philippines and Guam this name is applied to *H. mutabilis*.

Mapurito. See *Fagara monophylla*.

Maraga.

Perhaps the same as "maraca" or "matraca;" applied at Cataño to a species of Canna.

Marañon. See *Anacardium occidentale*.

Maranta arundinacea. ARROWROOT.

Family Marantaceae; an herbaceous plant with tubers from which arrowroot is extracted. Said to be called arrowroot from its property of counteracting the poison put on arrow tips by the natives and other acrid poison, as that of spiders. Called touola by the natives of Jamaica.

The following recommendations are from Captain Hansard:

"Elevation not important; rows 3 feet (90 centimeters) apart, 12 inches (30 centimeters) in a row. Cut off flowers to throw strength into the tubers. Plant in April or early May; returns will be had in a little less than twelve months. Twenty per cent starch may sometimes be secured. Crop seven hundredweight (329 kilograms) per acre, but double this has been obtained by high cultivation. In preparation all skin and discolored parts are removed from the rhizomes After rewashing the rhizomes are reduced to pulp in a mortar or against a revolving cylinder grater. Cleanness is very necessary. In St. Vincent glass-roofed houses and the very cleanest machinery are used."

Maravedi. See *Myginda rhacoma* and *M. pallens*.

Maravilla. See *Hibiscus mutabilis*, *Mirabilis jalapa*, and *Euphorbia heterophylla*.

Maray-maray. See *Dalbergia ecastaphyllum*.

Marcgravia rectiflora jacquini. BEJUCO DE PALMA.

An indigenous trailing or climbing shrub known also as bejuco de rana. According to Urban, *Marcgravia umbellata* of Grisebach's Flora includes this species, but the genuine *umbellata* does not occur in Porto Rico.

Marcgravia sintenisii. BEJUCO DE PALMA.

A species peculiar to Porto Rico and said to be very distinct from *M. rectiflora*. It is a climber and ascends large trees. Reported from the Sierra de Luquillo, Sierra de Naguabo, Cayey, and Adjuntas. (Urban, Add. 3: 208.)

Marcgravia umbellata. PEGA PALMA.

A trailing shrub clinging to trees by adventitious roots, called "bejuco de palma," by Bello. (Stahl, 2: 129.)

Margarita. See *Cosmos caudatus* and *Bidens pilosa*.

Mari-Lopez. See *Turnera ulmifolia* and *T. pumilea*.

Maria.

A tree from all parts of the island; height, 45 to 50 feet (13 to 15 meters); diameter, 25 to 30 inches (62 to 75 centimeters). Wood pinkish, hard; specific gravity, 0.800; used in building houses. (Exp. 1857.)

Enumerated by Hill among trees yielding resin. Perhaps the same as "palo de Maria."

According to Captain Hansard this species yields the balsam of Tolu. The extract is not made in Porto Rico, but extensively used by the druggists. Specific gravity of wood, 0.91.

Marias. See *Calophyllum calaba.*

Marialva elliptica. See *Tovomita elliptica.*

Maricao. See *Byrsonima spicata.*

A tree from all parts of the island; height, 40 to 45 feet (13 to 15 meters); diameter, 25 to 30 inches (62 to 75 centimeters). Wood dark, hard; specific gravity, 0.730; used in building houses. (Exp. 1857.) (Grosourdy, 2: 401.)

Captain Hansard gives the specific gravity at 0.78, and says that it is a good firewood.

Marimbo. See *Lagenaria vulgaris.*

Marimbo is the name applied to a Central American musical instrument resembling a xylophone, which in former times had gourds hung beneath the keys. In some parts of Africa the name is given to a kind of drum.

Marimbo amargo. See *Lagenaria vulgaris.*

Marlierea dussii.

A small indigenous myrtaceous tree, known in Porto Rico only from the neighborhood of Adjuntas. In Guadeloupe the same species is said to grow as a shrub of 15 feet (5 meters) or less, half the size it attains in Porto Rico. *M. sintenisii*, an allied species, is known only from Luquillo. (Urban. Add. 108.)

Marmelluelo.

Captain Hansard mentions this wood as having a specific gravity of 1.02.

Martinezia.

Specimens of the flowers and fruit supposed by Dr. Drude to belong to Martinezia or Bactris (Sintenis no. 2500) were collected in the forest of Monte Hormigas near Jauco. The spathe is unarmed; the branches are long, slender, and attenuate. This may be the species collected by us at Vega Baja. There are no leaves with this specimen. Another specimen (Sintenis no. 2628) from Hato Grande, on slopes toward Monte Gregorio, has a much larger and thicker inflorescence with the main axis beset with slender black spines from one-quarter to 1 inch (6 to 25 millimeters) in length. The branches are much coarser than in the other specimen and the pinnae have irregularly crowded plications at base, showing a tendency to the grouped condition found in the South American species. There are no spines on the pinnae, and very scattering slender ones on the median carina of the rachis.

Marrubio. See *Mesosphaerum suaveolens* and *M. spicigerum*

Marrubio blanco. See *Mesosphaerum lantanaefolium.*

Marrubio-boton. See *Mesosphaerum capitatum.*

Marrubio oscuro. See *Mesosphaerum atrorubens.*

Marsypianthes hyptoides. ORTELA.

An herbaceous suberect annual of the mint family, found in sandy places. (Stahl, 6: 191.)

Martin avila. See *Chione glabra.*

Martynia diandra. UÑA DE GATO.

Family Martyniaceae; an annual herb found on the south coast. Bello gives the common name "escorzonera." (Stahl, 6: 265.)

Marunguay. See *Zamia erosa* and *Z. portoricensis.*

Masa. See *Hedwigia balsamifera.*

A tree from the eastern part of the island; height, 35 to 40 feet (11 or 12 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood ash-colored, hard; specific gravity, 0.827; used in building houses. (Exp. 1857.)

Mástic.

The true mastic tree, *Pistacia lentiscus*, is a native of the Mediterranean region, and is not known to have been introduced into the West Indies, where the name is applied to *Bursera simaruba*, also called the West Indian mastic.

Mastuerzo. See *Lepidium virginicum.*

Mata de niguas. See *Tournefortia hirsutissima.*

Mata de peo. See *Lasianthus lanceolatus.*

Mata de seda. See *Calotropis procera.*

Mata-gallinas. See *Solanum caribaeum.*

Matayba domingensis. Raton.

A tree of 10 to 15 meters; family Sapindaceae. Reported from Adjuntas, Utuado, and Sierra de Luquillo. *M. apetala* is also reported from Utuado and Luquillo. (Urban, Symb. **1**: 351.)

Matillo.

A tree from all parts of the island; height, 25 to 30 feet (8 to 9 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood red, rather hard; specific gravity, 0.613; used for lumber. (Exp. 1857.) (Grosourdy, **2**: 401.)

Mato. See *Dioclea reflexa.*

Mato amarillo. See *Caesalpinia bonducella.*

Mato azul. See *Caesalpinia bonduc.*

Mato blanco. See *Caesalpinia bonduc.*

Mato colorado. See *Canavalia rusiosperma.*

Red sea beans on sale by an herb dealer in the market of Ponce as a remedy for piles, used in combination with the gray beans of *Caesalpinia bonducella*, as described under "tortera."

Mato de la playa. See *Canavalia obtusifolia.*

Mato palo.

A moderately abundant wild tree, 40 to 50 feet (12 to 15 meters) high, with a rather long, straight trunk 6 inches (15 centimeters) in diameter. It furnishes a rather light soft wood, fibrous in texture, soft and fine-grained. Yellow, or sometimes light cinnamon-colored, with numerous parallel lines, giving it a very beautiful aspect. Its most common use is in making small boats, tubs, and wash basins. Specific gravity 0.450. Also called "gaguey" and referred to the genus Ficus. (Grosourdy, **2**: 392.)

Matos. See *Ormosia krugii* and *Mucuna urens.*

Matos colorados. See *Canavalia ensiformis.*

Matos de playa. See *Caesalpinia bonduc.*

Matraca.

The Spanish word for rattle; applied in Porto Rico to rattles made from the calabash tree, *Crescentia cujete*, and also to *Crotalaria retusa*, the ripe seeds of which become loosened and rattle in the pod.

Mauricia. See *Mauritia flexuosa.*

Mauricio. See *Magnolia portoricensis.*

Mauritia flexuosa.

A palm mentioned and described by Hill under the names "moriche" and "palma moriche." The species is a tall South American fan-palm, native in the valleys of the Orinoco and Amazon. It grows in great abundance and forms extensive forests in level regions subject to annual overflow, and furnishes a large part of the material of subsistence and native arts of whole tribes of Indians. It is not, however, known from Porto Rico or, as a native, from any part of the West Indies. According to Maza it and *Mauritia setifera* (probably an error for *setigera*, a species native in Trinidad) are cultivated in Cuba and called "palma mauricia." As a useful tree which will flourish in swampy places this species might be of some utility in Porto Rico.

Mauritia setifera and Mauritia setigera.

See note under *Mauritia flexuosa*.

Mauritius hemp. See *Furcraea gigantea*.

Maya.

A name applied to the fruits of the wild piñuela, *Bromelia pinguin*, used as a remedy for worms.

Mayepea caribaea. AVIPILLO.

Family Oleaceae; a tree reported as collected by Sintenis at Fajardo—perhaps the same as Abispillo of Captain Hansard's list.

Mayepea compacta. PALO DE HUESO.

A tree 10 to 12 meters high. White, hard wood used for heavy timbers. (Stahl, **6**: 60, as *Linociera compacta*.)

Mayepea domingensis.

Variously named "palo de hueso," "huesillo," "hueso blanco." A native tree reported from Bayamon, Caguas, Sierra de Luquillo, Utuado, and Quebradillas. It is the same as Stahl's *Linociera compacta*. An allied species, *M. axilliflora*, comes from mountain forests at "El Manil." (Urban, Add. **1**: 61.)

Maza.

Not used for special purposes; a common wood in the hills; specific gravity, 0.87. (Hansard.)

Medicago sativa. ALFALFA.

Alfalfa has not been found successful in humid tropical countries. A substitute has been suggested in phasemy (*Phaseolus semierectus*).

Medlar.

Reported by Hill among "forest trees yielding fruits." The reference is, however, to be understood as applying to *Achras sapota*, the sapote or sapodilla, neither the true medlar, *Mespilus germanica*, nor the Japanese medlar or loquat, *Eriobotrya japonica*, being known to the Porto Rican public.

Meibomia. ZARZABACOA.

A large genus of leguminous herbs, formerly known under the name Desmodium. Several of the species are useful forage and soiling plants.

Meibomia adscendens. ZARZABACOA GALANA.

A creeping woody annual found in dry pastures. The flowers are pale lavender or whitish. (Stahl, **3**: 42, as *Desmodium adscendens*.)

Meibomia axillaris. ZARZABACOA DE MONTE.

A creeping or trailing annual, frequenting shady places in mountain districts. This species is too diffuse in habit and too woody in structure to be likely to prove of economic value.

Meibomia barbata. ZARZABACOA PELUDA.

A shrubby species found in dry pastures. Known from Lares. (Stahl, **4**: 45, as *Desmodium barbatum*.)

Meibomia incana. ZARZABACOA COMUN.

An annual or biennial shrub found in pastures. The variety *angustifolia* is reported from Rincon. The general habit of this species seems not unlike that of *M. axillaris*, and economic utility is improbable. (Stahl, 3: 43, as *Desmodium incanum.*)

Meibomia mollis. ZARZABACOA DULCE.

Found on the west coast. Also known from Juana Diaz. (Stahl, 3: 49, as *Desmodium molle.*)

Meibomia scorpiurus. ZARZABACOA COLA DE ESCORPION.

An herb 50 centimeters high, prostrate, common in arid pastures and stony places. (Stahl, 3: 46, as *Desmodium scorpiurus.*)

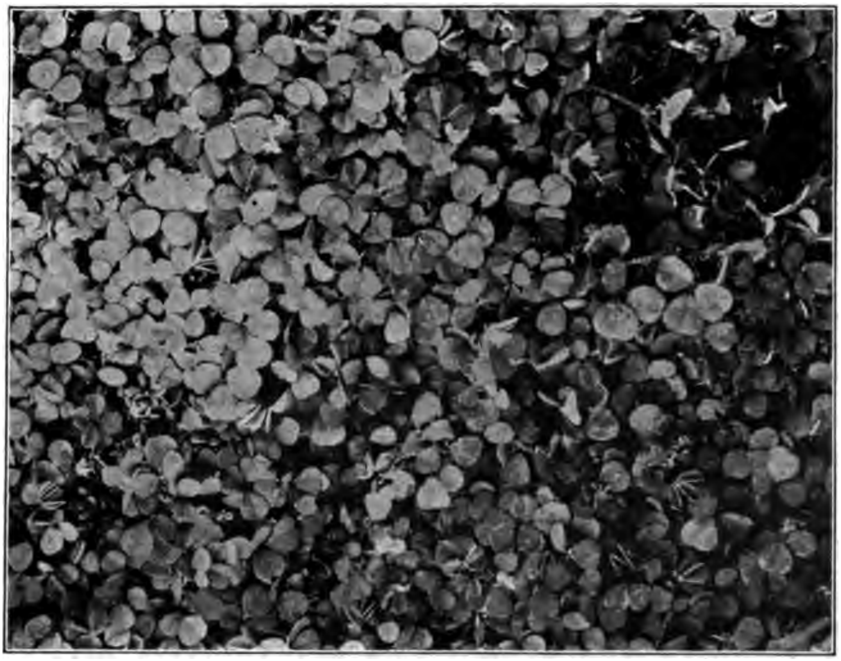


FIG. 12.—Lawn of *Meibomia triflora*. Coamo Springs.

Meibomia spiralis. ZARZABACOA ESPIRAL.

A slender species attaining a height of 2 feet. A form much more delicate and leafy than usual was collected at Coamo Springs (No. 716). This might be of interest if the plant should be found of economic utility. In the Index Kewensis the present species is treated as a synonym of *Desmodium neomexicanum*, but specimens in the National Herbarium do not indicate close affinity.

Meibomia tortuosa. FLORIDA BEGGAR-WEED. ZARZABACOA TORCIDA.

A shrub, 1 meter high, found along roadsides and in moist mountainous places. This is the species now somewhat extensively cultivated in our Southern States as a forage and soiling crop. From its habit and general characteristics it would seem that the form mentioned under *Meibomia spiralis* might be preferable, at least from the forage standpoint. (Stahl, 3: 48, as *Desmodium tortuosum.*)

Meibomia triflora. ZARZABACOA DE TRES FLORES. FIGURE 12.

A small herbaceous annual, found in dry places along the coast. This species was collected in a dry, exposed situation at Coamo Springs, where it covered the otherwise bare ground with a dense mat of green, the small leaflets giving a very pleasing effect like a white clover lawn and suggesting a possible use for this plant. (Stahl. 3: 41, as *Desmodium triflorum.*)

Meladillo. See *Plumbago scandens.*

Melanthera deltoidea. CARIAQUITO BLANCO.

A perennial composite herb 1 meter high, found in waste places and on the lower slopes of mountains. (Stahl. 5: 140.)

Melia azedarach. LILAILA. PLATE XLV.

A meliaceous tree or shrub commonly known as "China berry" or "pride of China," introduced from the Old World. It grows 5 or more meters high and is found as an ornamental in gardens, etc. The bark of the roots is said to be an efficacious vermifuge, while the pulp of the fruit is considered poisonous. (Stahl. 2: 164.)

The wood is rose-colored, rather hard, breaking vertically. Used by the country people in making tool handles. (Grosourdy. 2: 360.)

This author spells the native name "alilaila."

The china-berry is very commonly planted in Porto Rico as a shade or rather as an ornamental tree. The Porto Rican tree may, however, be a different species or variety, since it has not at all the umbrella-like habit found in the United States and in the Canary Islands. It grows with great rapidity, sometimes sending up a central stem 20 feet (6 meters) high in a year and a half. At a height of about 10 feet (3 meters) lateral branches from 4 to 6 feet (1.2 to 1.9 meters) long are emitted, while those of the upper part remain short, giving the tree a narrowly pyramidal form. The slender top often bends over or is broken off. The foliage is rather loose and open; flowers and fruit are produced in great abundance. The extremely rapid growth might give this species a limited use in coffee culture, particularly where it is desired to protect without loss of time an exposed slope; and the numerous slender branches of the tree would also enable the shade to be removed gradually. Considerable shelter from winds and a moderate degree of shade could be secured by planting the china-berry from 2 to 4 rods apart.

Melia sempervirens. See *Melia azedarach.*

Melicocca bijuga. GENIP TREE. GENIPE.

A tree belonging to the family Sapindaceae, believed by some botanists to be native in the West Indies, by others thought to have been introduced from South America. It produces clusters of oval fruits about an inch in length. The pulpy covering of the seed is edible and has a pleasant flavor, but the fine fibers compact themselves against the mucous membranes and cause a very disagreeable sensation. In the Bulletin of the Jamaica Botanical Department it is stated that this material has caused the death of children by forming a coating over the lining of the stomach.

The tree is vigorous and handsome and has been recommended for planting along roads and avenues for shade. The timber is said to be hard and heavy.

Radlkofer gives the following collection of names for this tree: Honigbeere, mamon, mamoncillo, knippa, knepier, guenepe, and genep tree. The Porto Rican pronunciation heard by us was, however, distinctly "genepe," not "guenepe," or "quenepa."

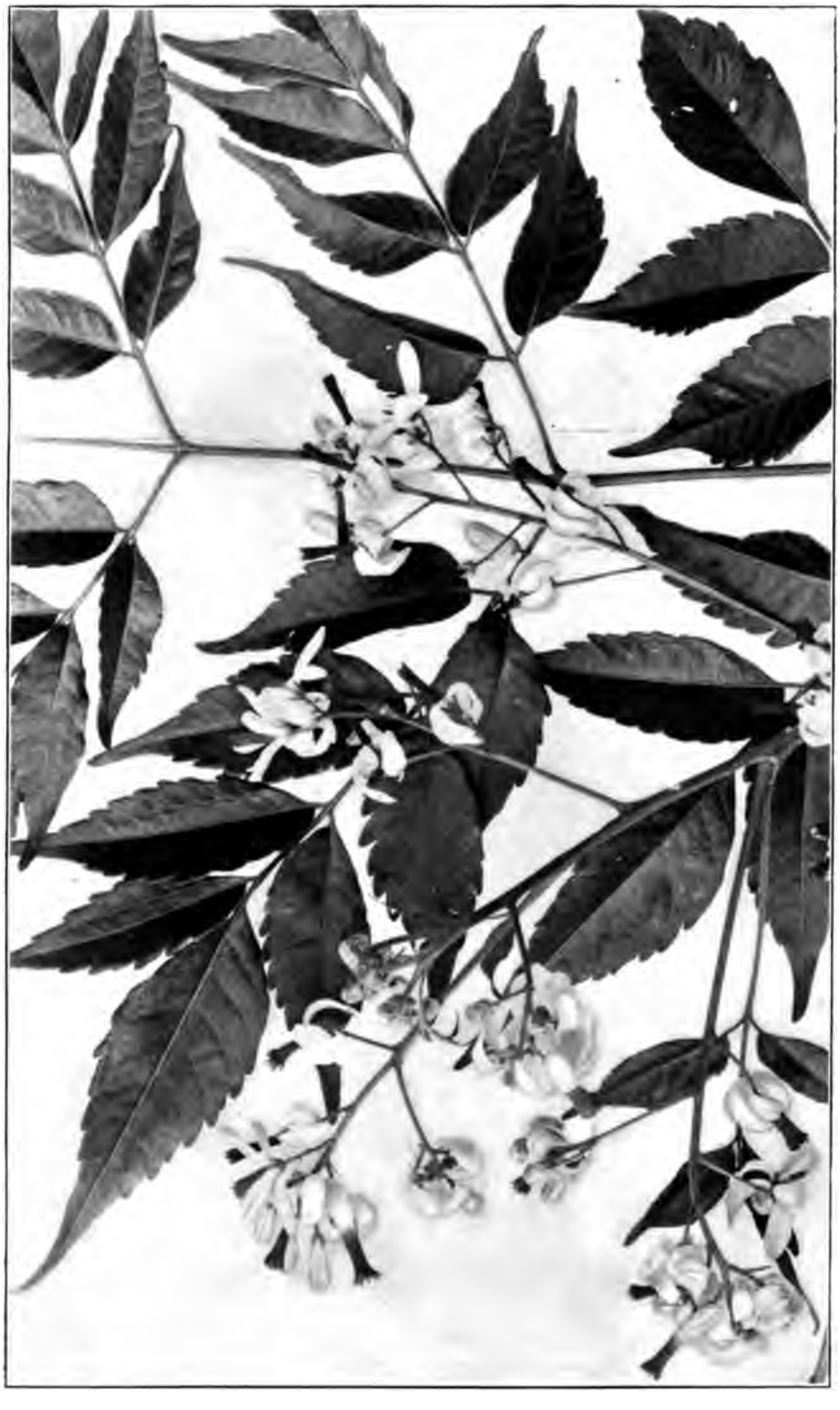
Meliosma herbertii.

Family Sabiaceae; shares with *M. obtusifolia* the names "cacao bobo" and "aguacatillo." A tree generally distributed in Porto Rico and the adjacent islands as far south as Grenada. Of medium size, with alternate, exstipulate, elliptical, or obovate acute leaves. (Urban, Symb. 1: 55.)

Meliosma obtusifolia. GUAYROTE.

Also called "arroyo," "aguacatillo," "cacao bobo," "cacaillo," "ciralillo," "serillos." A tree belonging to the family Sabiaceae, generally distributed

PLATE XLV.



CHINA BERRY (MELIA AZEDARACH).

throughout the island. It yields a valuable wood, and from the multiplicity of common names is evidently in use locally, though all the names are probably not confined in application to this species. Reported from near Adjuntas and Sierra de Naguabo. Differs from *M. herbertii* in having the leaves obtuse and the fruits very small, only half the size of the others. (Urban, Symb. **1** : 513; Stahl **6** : 43, as *Atelandra obtusifolia.*)

Melocactus communis. MELON DE COSTA.

Family Cactaceae; a fleshy plant 25 to 30 centimeters in diameter, found in dry places and cultivated. (Stahl, **4**: 184.)

Melochia hirsuta. BRETONICA PELUDA.

Family Sterculiaceae; an herbaceous, erect, shrubby annual, densely covered with soft hairs. (Stahl, **2** : 109.)

Melochia nodiflora. BRETONICA PYRAMIDAL. BRETONICA PRIETA.

A woody annual, 50 centimeters high, found in rocky places. (Stahl, **2**: 110.)

Melochia pyramidata. BRETONICA PYRAMIDAL.

A woody herb, 50 centimeters high, in sandy and stony pastures along the south coast. (Stahl, **2** : 107.)

Melochia serrata. BRETONICA ASERRADA.

According to Grisebach a shrub about 2 feet high, covered with long, soft hairs. (Stahl, **2** : 109.)

Melochia tomentosa. BRETONICA AFELPADA.

A shrub 1 meter high, in sandy coastal regions on the south side of the islands. (Stahl, **2** : 108.)

Melon. See *Cucumis melo.*

Melon de costa. See *Melocactus communis.*

Melothria fluminensis. PEPINILLO.

Family Cucurbitaceae; a climber 5 or 6 feet (1.5 to 1.9 meters) long, found in hedges and waste places. Fruit eaten, pickled when green; also good when fully ripe. (Stahl, **4**: 177.)

Mentha piperita. PEPPERMINT.

A plant named by Briquet as variety *citrata* of this species was collected in the borders of primeval forests near Adjuntas.

Mentrasto. See *Ageratum conyzoides.*

Mentzelia aspera. PEGADORA.

Family Loasaceae; a hairy herb with triangular dentate leaves and deep buff flowers. Our specimens were obtained to the southward of Coamo, not far from the military road.

Mesosphaerum atrorubens. MARRUBIO OSCURO.

Family Labiatae: an herbaceous annual, 40 centimeters high, in dry pastures. (Stahl, **4** : 194, as *Hyptis atrorubens.*)

Mesosphaerum capitatum. MARRUBIO-BOTON.

An herbaceous annual weed of the mint family. At Cataño it was called "blero." (Stahl, **4**: 192, as *Hyptis capitata.*)

Mesosphaerum lantanaefolium. MARRUBIO BLANCO.

An herbaceous reclining annual. (Stahl, **6** : 193, as *Hyptis lantanaefolia.*)

Mesosphaerum polystachyum. FALSO MARRUBIO.

An herbaceous climber, 1 to 2 meters high. (Stahl, **6** : 195, as *Hyptis polystachya.*)

Mesosphaerum spicigerum. MARRUBIO.

Reported by Bello.

Mesosphaerum suaveolens. MARRUBIO.

An herbaceous climber, 1 meter high; contains an oil with a strong odor. Grows in sandy soil. (Stahl, **6** : 196, as *Hyptis suaveolens.*)

Mesquit. See *Prosopis juliflora.*

Metastelma.

A genus of climbing milkweeds represented in Porto Rico by numerous species. (Urban, Symb. **1** : 245, a monograph.)

Miconia. See *Tamonea.*

Micropholis chrysophylloides.

Family Sapotaceae; reported from near Adjuntas.

Micropholis garciniaefolia.

From Sierra de Luquillo.

Micropholis portoricensis curvata.

From near Adjuntas.

Micropholis portoricensis mesnaefolia.

From near Peñuelas.

Micropholis urbani.

From Sierra de Naguabo.

Mignonette tree. See *Lawsonia inermis.*

Mikania. See *Willughbaeya.*

Millet. See *Panicum.*

Millo. See *Andropogon.*

The seeds of a millet were on sale in small quantities in the market of Ponce, and are said to be used in the preparation of a sort of flour and in sweets.

Mimosa ceratonia. ZARZA.

Family Mimosaceae; a vine-like shrub, 2 to 5 meters high, found in waste places. (Stahl, **3** : 143.)

Mimosa pudica. MORIVIVI. SENSITIVE PLANT.

A branching perennial, 2 to 5 feet (0.6 to 1.3 meters) high. The sensitive plant of greenhouses; an extremely common weed along roadsides and in waste places generally. (Stahl, **3** : 142.)

Mimusops globosa. SAPOTE DE COSTA.

Family Sapotaceae; a shrub, 3 to 4 meters high, growing in shaded situations along the sea coast. (Stahl, **6** : 54.)

Mimusops pleeana.

From Manati.

Mimusops riedliana.

From Yabucoa.

Mirabilis jalapa. FOUR O'CLOCK. MARAVILLA.

The well-known garden flower said to be called "siciliana" in Porto Rico, where it is cultivated and has also become naturalized as a weed in open places. It is a native of Mexico. (Urban, Add. **3** : 304.)

Mistletoe.

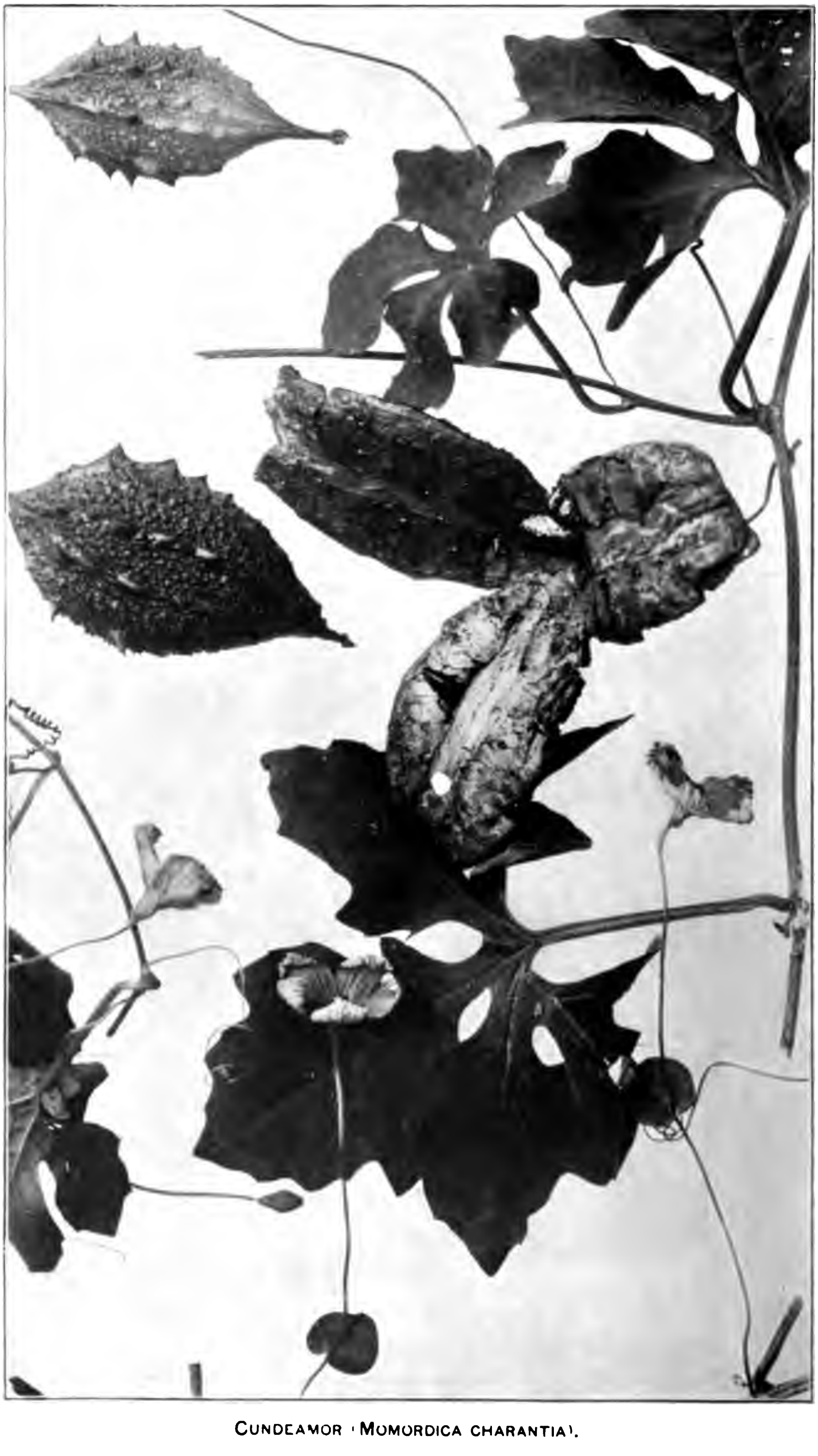
The true mistletoe, *Viscum album* of Europe, does not occur in West Indies, but there are numerous related parasites belonging to the family Loranthaceae and now referred to the genera Dendropremon, Dendrophthora, Phoradendron, and others.

Moca. See *Andira inermis.*

Moca acatera.

A tree from the northeastern part of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood yellowish, hard; specific gravity, 0.993; used for cabinetwork. (Exp. 1857.)

PLATE XLVI.



CUNDEAMOR (MOMORDICA CHARANTIA).

Moca amarilla.

A tree from the northeastern part of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood red, hard; specific gravity, 0.904; used for cabinetwork. (Exp. 1857.)

Moca negra.

A tree from the eastern part of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood dark, hard; specific gravity, 0.811; used for cabinetwork. (Exp. 1857.)

Molinillo. See *Leonotis nepetaefolia.*

Momordica.

A genus of Cucurbitaceae. The species are graceful and delicate climbing vines, bearing rather small edible fruits.

Momordica charantia. CUNDEAMOR. PLATE XLVI.

This species is supposed to be the most common and generally distributed, perhaps because confused with *M. zeylanica*, which in Porto Rico, at least, is much more abundant. The present species was not noticed by us, but has been collected by Sintenis at Fajardo. It differs from *M. zeylanica* in the much larger and longer fruit, the surface of which is irregularly covered with rounded warts and tubercles. The seeds are also much larger, and the leaves have a very different cut, as may be seen by reference to the figure.

Both species are sometimes called "balsam apple."

Momordica zeylanica. CUNDEAMOR.

This species is one of the commonest and most widely distributed plants in Porto Rico, climbing over fences and other vegetation in open places. Many botanists have confused it with *M. charantia*, but it may be recognized readily by the different leaf pattern, the small oval fruits with rows of sharp spines, and the small seeds.

Monkey apple. See *Anona palustris.*

Monodora myristica. CALABASH NUTMEG.

Also called "American nutmeg" and "Jamaica nutmeg." An anonaceous tree, supposed to have been introduced from West Africa. Its occurrence in Porto Rico seems doubtful, a species of Nectandra having, in some cases at least, been mistaken for it.

Grosourdy (2: 382) reports it from all parts of the island, and gives the height of the tree as reaching 25 or 30 feet (8 or 9 meters), with a diameter of 10 inches (25 centimeters). The wood, he says, is yellow, rather strong, but without application. His identification was perhaps based on the native name "nuez moscada del pais," in which case the description probably refers to a species of Nectandra.

Mora. See *Chlorophora tinctoria.*

Hill & Sudworth (p. 27) describe a wood of this name as follows:

> Color, bright orange brown, probably darkening with age and exposure. Marked on the radical section with parallel light and dark streaks. Large ducts arranged in wavy, irregular lines; lines also irregularly broken into crescent-shaped groups. Medullary rays distinct, rather coarse. Radically cut and polished surface satiny. Similar in general appearance to osage orange. Largely used for fellies.

Hansard gives the specific gravity as 0.86. Perhaps the same as "moral."

Mora amarilla.

A tree from the eastern part of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood, yellowish, hard; specific gravity, 0.807; used for cabinetmaking. (Exp. 1857.)

Moradilla azul. See *Salvia occidentalis.*

Moradilla encarnada. See *Salvia coccinea.*

Moral. See *Cordia macrophylla.*

A tree from all parts of the island; height, 45 to 50 feet (13 to 15 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood light, soft; specific gravity, 0.611; not used. (Exp. 1857.) (Grosourdy, 2: 402.)

Captain Hansard thought this might be the mulberry, *Morus nigra*, the leaf being similar, though the fruit is different. Specific gravity, 0.57.

At Coamo Springs another species of Cordia is known under this name. It is quite different from *C. macrophylla* and seems to have affinity with *C. collococca.*

Moralon. See *Coccolobis grandifolia.*

Moriche. See *Mauritia flexuosa.*

Moringa moringa. Horse-radish tree. Ben.

Family Moringaceae; a tree 3 to 4 meters high, native in India; reported as introduced and escaped from cultivation in Cuba and probably also in Porto Rico. At Cataño and also at Isabella it was called "angela" or angel tree. It yields the so-called oil of ben, used for fine lubricating purposes. The root has the taste and odor of horse-radish. Sintenis collected a specimen distributed as *M. oleifera* in a garden at Mayaguez. (Stahl, 2: 43.)

A specimen 20 feet (6 meters) high, with a trunk 8 or 10 inches (20 or 25 centimeters) in diameter, was seen between Yauco and Guayanilla.

Mori-vivi. See *Mimosa pudica.*

Other fine-leaved leguminous plants, such as *Aeschynomene americana* are also sometimes called mori-vivi or mori-vivi bobo.

Morongia distachya. Cuernecillo.

A much-branched, trailing, spiny shrub reported by Stahl from the south side of the island. (Stahl, 3: 136, as *Schrankia distachya.*)

Morongia leptoclada. Salcilla.

Collected at Coamo Springs (No. 726). A less spiny species than *distachya*, according to the specimens in the National Herbarium.

Morus. Mulberry.

No mulberry trees were noticed in Porto Rico, but in Cuba experiments are said to have shown that both the mulberry and the silkworm thrive extremely well.

Mostacilla del mar. See *Cakile maritima.*

Mostaza. See *Brassica juncea.*

Motillo. See *Sloanea berteriana.*

Mouriria.

Family Melastomaceae; a species thought to be related to *Mouriria spathulata* was collected at Hatillo by Sintenis. The lower side of the leaves is yellow.

Mouriria domingensis. Murta.

A cultivated shrub, 3 to 5 meters high. The agreeable fruits are eaten raw and are used to color liquors. (Stahl, 4: 91.)

Mucuna altissima.

Family Viciaceae; a leguminous vine, related to the velvet bean; known from Yabucoa; also from the vicinity of Ponce. (Sintenis.)

Mucuna pruriens. Cowhage. Pica-pica.

The pods of this leguminous plant, which is a close relative to the velvet bean, are covered with a dense growth of fine, rather stiff, poisonous hairs, said to be extremely irritating when brought in contact with the more sensitive parts of the skin. (Stahl, 3: 84.)

Mucuna urens. Ojo de buey.

A woody, biennial vine, growing in waste places. Bello gives "matos" as the common name of this species. (Stahl, 3: 85.)

Mucuna utilis. Velvet bean.

The velvet bean has been tried at a few points in Porto Rico, and vigorous growth is reported. In all probability it will be found one of many leguminous plants of value for restoring exhausted soils.

Mugwort. See *Parthenium hysterophorus.*

Mulberry. See *Morus.*

Multa.

Grosourdy (**2**: 402) refers this to the genus Eugenia, and describes it as a wild fruit tree, 15 to 20 feet (4 to 6 meters) high, with rather hard, resistant wood, the only use of which is in making charcoal.

A sample of fruit called "multas" in the San Juan market was not unlike those of the genus Eugenia. The pulp, though very thin, is of a pleasant taste, not unlike that of gooseberries.

The name "murta," given by Urban as the common name of *Eugenia floribunda* and *E. cordata sintenisii* and by Stahl for *Mouriria domingensis*, may in one or more cases be another spelling of "multa," misunderstood for the Spanish word for "myrtle."

The word "multa" is given in Velásquez's Spanish dictionary as the name of a fruit tree in Porto Rico.

According to Captain Hansard this name is applied to a wood with a specific gravity of 1.06, found in Vieques, and used for coloring rum.

Muñeca. See *Cordia borinquensis* and *Gilibertia arborea.*

A tree from the eastern part of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood, ash-colored, soft; specific gravity, 0.951; used for lumber. (Exp. 1857.) (Grosourdy, **2**: 403.)

A soft, light, inferior wood, found occasionally in the hills; specific gravity, 0.59. (Hansard.)

Muñeca de costas.

A tree from the northern part of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters.) Wood, yellowish, rather hard; specific gravity, 0.923. (Exp. 1857.) Used for fuel. (Grosourdy, **2**: 403.)

Murraya exotica. Café de la India.

Family Rutaceae; a shrub, 2 to 3 meters high, native in the East Indies, and naturalized in the West Indies and on the continent. It is cultivated in gardens for its abundant and fragrant flowers and for its agreeable, small, reddish tart fruits, which much resemble coffee berries, although in reality the plant is closely related to the orange. (Stahl, **2**: 135.) Near Carolina this plant was called "dama de noche," a name supposed to belong to *Cestrum nocturnum.*

The rather straight trunk is sometimes as thick as a man's thigh, but is ordinarily smaller. It furnishes a wood very similar to the boxwood of Europe, which it might very well replace. The wood is durable, yellowish white with brownish heart, fine-grained and dense, strong and solid. Very good for turned articles and susceptible of a polish. Specific gravity, 0.979. (Grosourdy, **2**: 366.)

Murta. See *Eugenia floribunda*, *E. cordata*, *E. sintenisii*, and *Mouriria domingensis.*

Musa. Banana. Guineo.

The culture of bananas for export is one of the industries which could be added to the resources of Porto Rico with every hope of success. Although furnishing, perhaps, the most important food crop of the island the banana is seldom treated to any approximation of regular cultivation. To a large extent, the growing of bananas has gone hand in hand with the planting of coffee, for the shading of which large numbers of bananas are required. Extensive fields, which appear to be devoted to bananas, are usually found, on careful inspection, to conceal spindling coffee plants. So many bananas are produced in this incidental manner that there has been little necessity for special cultivation to supply the local markets. Neither has any sustained attempt been made to maintain the quality or productiveness of any of the varieties, so that a general deterioration has probably taken place, instead of the rather careful though apparently desultory selection to which bananas are subjected in many tropical countries. As the edible bananas are seedless, all propagation is by cuttings of buds or branches which arise from root stocks. It is thus usually possible for natives to select good stock of any desired sort when setting out new plants, and therefore in most countries the bearing qualities, at least, are maintained. But in Porto Rico there has been comparatively little incentive to care in special planting. Our failure to find any marketable bananas seemed at first very strange, until the local conditions were understood. Moreover, the deficiency is further explainable by the fact that the banana is extremely responsive to good treatment, and really first-class fruit can be produced only under favorable conditions, requiring little attention to the enrichment of the soil. As such care is seldom forthcoming in Porto Rico it is doubtful whether high-grade stock of any of the local varieties could now be secured in the island.

Choice of varieties.—Accordingly, if the commercial planting of bananas is to be undertaken in Porto Rico it will be necessary either to make a careful choice of stock, which owing to special care has retained its vigor and productiveness, or to make new importations from other parts of the West Indies or from Central America. The Martinique or Jamaica banana, the variety almost exclusively imported into the United States, is nowhere particularly esteemed in the Tropics except for export purposes, and comparatively few are raised in Porto Rico, so that it is extremely doubtful whether plantations of any size could be stocked without some loss of time, unavoidable on account of the rather slow propagation of the superior varieties of the banana. Of course it would be useless to plant an indiscriminate mixture of varieties, the produce of which would be quite unmarketable abroad. At the same time it is proper to consider the question whether in view of the comparatively ready access to the American market it will not be wise to plant in export quantities some one of the numerous varieties superior to that now known in the trade. The value of the common sort lies in its shipping qualities, which result from the fact that it shares some of the attributes of the plantain in being of rather coarse texture, with a tough skin and a large quantity of mealy outer coating of the flesh, which gives the dry sensation and, when not thoroughly ripened, the astringent taste. Really fine varieties are so superior in flavor and texture that once regularly introduced into the trade they would certainly secure the popular preference and command special prices. It is true that the more delicate texture of most of the high-grade varieties would probably render it necessary to use somewhat greater care in shipping. But methods of packing and ventilation are now so far improved that some of the better varieties could undoubtedly be brought to our markets in time to reach the consumer in good condition. One of the requisites of the success of such an experiment should, however, be kept in mind. No matter how excellent the fruit may be, the public will not have a chance to assert a preference until it can be sent in quantities large enough to give it a place in the regular fruit trade. Many failures in opening new lines of agricultural activity have resulted from the fact that trial shipments were so small that the merchants would not take the trouble necessary to properly introduce an unknown product to the public.

As one instance of a superior banana which might be grown in Porto Rico may be mentioned a variety of the dwarf banana (*Musa cavendishii*), the same species which is cultivated in the Canary Islands for the English market. The Canary bananas are not, however, of particular excellence, having, if anything, even more of the objectionable taste and mealy texture. The better variety is cultivated in Liberia, and even when ripe has a greenish rather than a yellow color. The skin is rather thin, there is no astringency, and the compact and yet delicate creamy texture and delicious flavor render the inferiority of our ordinary imported fruit distastefully evident to all who have the opportunity of comparison. The dwarf banana tree reaches a height of only 6 or 8 feet (2 or 2.5 meters), and the enormous bunches reach nearly to the ground and weigh in the neighborhood of 100 pounds. The individual bananas are of medium size and rather slender in comparison with those known in our markets.

Botanical knowledge of the banana.—It might naturally be expected that the botany of so important a plant as the banana would be in an advanced state of completeness; but quite the contrary is true, owing to the fact that economic plants are generally neglected by botanical students and collectors, especially when, as in the present instance, specimens are very difficult to preserve. No part of the banana plant is adapted to ordinary herbarium treatment, neither the enormous leaves nor the succulent flowers and fruits.

It is accordingly quite impossible to tell from books whether the superior African variety mentioned above is known in other parts of the world. In Porto Rico the names "congos" and "guineos" are applied to several varieties of banana, and there are also traditions that, like the cattle and Guinea grass, they were introduced from the Dark Continent. We had no personal opportunities of testing the variety called "enano," or "dwarf," which may prove to be the same as the African sort, though it is much more likely to have been derived from Canary Island stock. Bananas are not native in America, but several wild species with seeds are known in British India and the Malay region, where there are also large numbers of cultivated varieties, very few of which have been introduced into any part of tropical America. It would seem that the country which makes by far the largest banana trade in the world should enjoy the advantage of the best that could be afforded in the way of this now popular fruit, and that Porto Rico might realize brilliant results from the culture of high-grade varieties.

Porto Rican varieties.—Hundreds of varieties are known to exist in the East Indies, particularly in the Malay Archipelago and in the Philippines, but these are so confused and so poorly described that it is impossible to tell which of them has been introduced into Porto Rico, and even between the different West Indian islands the identity of varieties can not be asserted with confidence, even when they bear the same name. As an illustration of the confusion which may exist, even on the same island, our notes on Porto Rican varieties may serve a salutary purpose.

In addition to what was obtained from other sources, we had the advantage of the information gathered by two gentlemen who had given the subject considerable attention—Captain Hansard, of San Juan, formerly resident in the Luquillo region, and Mr. Mead, of Ponce and Peñuelas. The following alphabetical list of names, while probably incomplete and perhaps erroneous, may serve as a beginning in the collection of more complete information:

PORTO RICAN VARIETIES OF BANANAS.

Amarillo.—A name applied to the large plantain (plátano), especially when sliced and fried. (Ponce.)

Bulico.—See *Horse plantain.* (Ponce.)

Cambur.—A name given by Hill; not known to Captain Hansard. In Venezuela it seems to be a generic term for the bananas, as distinguished from the plantains.

Chinese.—See *Dwarf.*

Colorado.—See *Morado colorado.*

Commissario.—A name for plantains; thought to be the same as mafafo, or horse plantain.

Datil.—A name used about San Juan for a very small banana (fig. 77). Perhaps the same as niños. Although called manzanas by some of the hucksters, they had none of the apple flavor and were otherwise inferior.

Dominico.—Captain Hansard states that this name is applied in Porto Rico to the gigantes or Jamaica bananas, but the first use of it by Acosta had reference to a small, white, delicate species from Santo Domingo. In Venezuela the name "plátano dominico" is used for "the royal, or small-fruited, plantain." This is said to be "very similar to the small plantain in appearance and habit. The fruit, however, is smaller and the plant somewhat hardier; that is, it bears better the cold of the mountains."

Dwarf.—In the English-speaking tropics this name is applied to *Musa cavendishii*, also known as the Chinese banana. The name "enano," in use for a banana variety in Porto Rico, probably has reference to the above species, which is that cultivated in the Canary Islands.

Enano.—This name means "dwarf," and has reference to the tree rather than the fruit. It may prove to be *Musa cavendishii*, like the "platanos congos" at Ponce.

Fig.—A name used in the British Island for the Martinique or Jamaica banana, the variety commonly used in the United States.

Fig la rose.—Said to be the name used in Dominica for the Martinique or Jamaica banana.

Figue.—A name of the above in the French Islands.

Fotoko.—A variety said by Captain Hansard to be midway between a plantain and a banana, but not fit to eat uncooked. The name seems to be one of African origin.

Giant.—See *Gigante*.

Gigante.—According to Mr. Mead this is the same as the Martinique banana. The fruit grows very large, sometimes 10 inches (25 centimeters) long, but is slender and very angular. Eaten mostly cooked, especially with wine, and used for making "dulce" or preserves. In the San Juan market this name was used for a much smaller fruit, apparently derived from a form of *Musa cavendishii*.

Gros Michel.—See *Martinico*.

Guadeloupe.—See *Martinico*.

Guineo amarillo.—A name used in the San Juan market for a medium-sized banana which some of the dealers called "gigantes." The fruits seemed rather to resemble those of *Musa cavendishii*.

Guineo de manzana.—See *Manzana*.

Guineo de piña.—The smallest variety known to Captain Hansard, and not the same as datiles, thin-skinned; stem bright green; leaves broad; not so tall as the gigantes and less liable to have the leaves stripped by the wind. See also "*Guineo de rosa.*"

Guineo de rosa.—A name used about Ponce for a variety also called guineos de piña. These were described as short, yellow, rather thick, and slightly angular. The taste is sweet and not astringent.

Guineo de tierra.—A very inferior sort of plantain, According to Captain Hansard vinegar is not made from the ordinary plantain as indicated by Hill, but from the present variety which is grown for that especial purpose.

Guineo indio.—A red banana grown about Ponce. The golden yellow flesh is said to be of very fine quality, much preferred by many Americans. Bunches over 3 feet (1 meter) long are sometimes secured under favorable conditions.

Higo.—See *Martinico*.

Horse plantain.—An English name for the mafafo or short plantain.

Horton.—According to Hill and Hansard this is the name for the plantain, presumably the long-fruited type. In Venezuela the common plantain is said to be called "*plátano arton.*"

Jamaica.—A name used in the American trade for the large yellow bananas now practically the only variety brought to our markets. Jamaica is the center of the West Indian banana-growing industry, but the present variety is not confined to that island, and is not called "Jamaica" except by us. In the different islands it has many other names such as fig, figue, gigante, gros Michel, Guadeloupe, Martinique, etc.

Mafafo.—Apparently the most common Porto Rican name for the short angular plantain, sometimes called the horse-plaintain by the English-speaking people. The mafafos are smaller, shorter, and thicker than the genuine plantains and the cross section is very angular. Quality and texture differ from the plátanos in being more mealy; the skin is extremely thick. This variety is peeled and toasted in the charcoal ashes and is then called "native bread;" it is frequently sold in the market. There are several other native names, such as bulicos, commissarios, and mata hambre, or "hunger-killer."

Manis.—This name seems to be unknown at San Juan, but Captain Hansard became acquainted with the variety in the vicinity of Luquillo, and declares it to be the best in the island, describing it as more substantial and yet with a more delicate flavor. There are at least three slightly different varieties. The individual fruits are small, only 4 or 5 inches in length, like the "datile" and "piña." A medium-sized tree with rather few leaves; the stem becomes superficially red with age. There is another similar variety, coarser and larger, and not tasting so well. Perhaps this is the "niño," a name unknown to Captain Hansard.

Manzano.—Specimens of this variety were kindly sent to us by Mr. Graham, of Ponce, under the name guineos de manzana. These were of a very bright yellow color, with a very thin and delicate skin, fine and soft texture, and very pleasant taste, with a distinct flavor of apple. An over-ripe apple is perhaps suggested, but the banana texture and flavor overcome any objection of that kind, and there is no mealiness or unpleasant aftertaste. This is, in short, an exceedingly fine fruit, but one which is looked upon as a delicacy rather than a regular product. In the unripe state the manzana is said to be particularly astringent, but this quality disappears with maturity. The tree is somewhat smaller than that of the niño and other varieties except the dwarf. The bunches of the manzana are generally small, seldom reaching 100 fruits.

Martinico.—According to Mr. Mead this name is used on the south side of the island for the variety more commonly known as "gigantes," the gros Michel or Jamaica banana.

Mata hambre.—See *Mafafo.*

Morado.—See *Morado colorado.*

Morado blanco.—Like the morado colorado in taste, form, texture, etc., but green, not becoming red, but yellow when ripe.

Morado colorado.—A very large, red variety. Captain Hansard has seen bunches of 100, of which the smallest fruit was 8½ inches (21 centimeters) in circumference, the largest over 9 inches (22 centimeters). The tree is the largest of any of the varieties and is on this account desirable for shade, but the fruit is not liked by the people of Porto Rico, hence there is no local market.

Niño.—Yellow, short, slender, slightly angular; taste very sweet, without acid or unpleasantness; trees about same size as the large varieties.

Piña.—See *Guineo de piña.*

Plantain.—In English this name is used either as a general term for all the banana-like fruits or, more commonly, it is restricted to the coarser varieties which are inedible without cooking.

Plátano.—Used alone, this name seems to refer in Porto Rico to the long plantain and not to the short plaintain, or "mafafo."

The plátano is eaten only in the cooked condition, being generally sliced and fried, although often boiled or combined with other materials. The fruits are very often large, thick-skinned, and angular. They are generally cooked while still green, but if allowed to mature they become yellow and then black.

Plátano Congo.—Considered by Mr. Mead the finest of the Porto Rican bananas. Very slender and well flavored, eaten either raw or cooked; grows on a small tree and in large bunches. From the description this seems to be close to the African dwarf banana; but the fruit is said to become very yellow and the leaves to be entirely green, including the stems. These discrepancies seem to indicate at least a varietal difference, though botanical varieties of *Musa cavendishii* seem not to have been distinguished.

Plátano largo.—See *Plátano.*

St. Michael.—Probably an error for gros Michel.

Musa textilis. MANILA HEMP. ABACÁ.

The Philippine Islands are the home of this important fiber plant and the industry based on it. Various attempts have been made to introduce the culture of Manila hemp into other regions, thus far without success, probably because the process of extraction, though very simple, requires experience and skill.

Muskwood.

In the British West Indies this name is said to be used for *Moschoxylum swartzii* and *Guarea swartzii.*

Myginda latifolia.

A branching celastraceous shrub, 3 to 4 feet (1 to 1.3 meters) high. Reported from Salinas de Cabo Rojo.

Myginda pallens. MARAVEDI.

A low shrub. (Stahl, 4: 22.)

Myginda rhacoma. MARAVEDI.

A low shrub from along the seacoast; 1 to 2 meters high. Reported from Rincon. (Stahl, **4:** 21.)

Myginda rotundata.

Known from Guanica (Sintenis). This species is considered by Urban to be a monstrosity. It has clusters of very fine branches covered with small brown scales, apparently hexenbesens.

Myrcia coriacea. HOJA MENUDA.

Family Myrtaceae; a shrub 3 meters high; in waste places in dry regions. (Stahl. **4:** 74.)

Myrcia deflexa. CIENEGUILLO.

An indigenous tree, sometimes exceeding 50 feet (15 meters), distributed throughout the mountainous districts, furnishing hard wood, also called "guayavacon." (Urban, Add. **2:** 105; Stahl, **4:** 76.)

Myrcia divaricata. See *Myrcia leptoclada*.

Myrcia ferruginea. CIENIGUILLO.

A shrub 3 to 5 meters high, found in waste places. The red, hard wood is used to make canes. (Stahl, **4:** 77.)

Myrcia leptoclada. GUAYAVACON.

An indigenous tree said to reach a height of 30 feet (9 meters). Known from Luquillo, Yabucoa, Maricao, and Añasco.

Myrcia pagani. AUSU.

An indigenous tree known only from sterile branches collected in forests in the Sierra de Lares.

Myrcia paniculata. HOJA MENUDA.

An indigenous tree reaching height of over 50 feet (15 meters), and furnishing a durable, flexible wood. Reported from Bayamon, Cayey, Aibonito, Rincon, Manati.

Myrcia sintenisii.

Has large elliptical leaves 7 inches long (17 centimeters); from Lares.

Myrcia sororia. See *Myrcia splendens*.

Myrcia splendens. RAMA MENUDA.

Also called "hoja menuda." A shrub or small tree, indigenous in Porto Rico and found in forests and thickets in numerous localities from Luquillo to Mayaguez. *M. berberis* is known in Porto Rico only from the Luquillo region. (Urban, Add. **2:** 101.)

Myrica cerifera. BAYBERRY. ARRAYAN.

The common bayberry of the Eastern States; extends to Cuba, Porto Rico, Santo Domingo, and Guadeloupe. In Porto Rico it has been collected in mountain forests near Utuado, Las Marias, and Mayaguez, as well as in humid meadows and sandy beaches near Bayamon.

The following account written about 1831 indicates that this tree must have been formerly of much greater importance than at present:

The "cerero" tree grows naturally in regions that are not extremely cold, and in humid temperate regions, particularly the plains and shores along the rivers; also in all regions that produce wheat, whether high or low. Its size is that of an ordinary olive tree or sometimes smaller. The fruit resembles the seeds of the pepper of Castile. Experience has shown that each large tree well fruited yields two "almudes."[a]

Smaller trees produce one almud and the poorer one-quarter. Annually they gather two crops; the first is more abundant than the second and lasts from March until May.

The season to collect the fruit is when it is white or ashy. Well dried in boxes it can be kept a year without spoiling, and from each half almud you obtain a pound of wax more or less in the manner described below.

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[a] An "almud" is a measure given as either about 8 or 50 pounds.

The collected fruit is broken up and spread on hides or boards in a well-ventilated place out of the sun. It is turned gently each day for thirty days, when they proceed to extract the wax; but the wax may be extracted as soon as the fruit is gathered, in which case the wax is too green in color, while after thirty days it is whiter. It is kept from the sun because it melts part of the fruit and wastes a part of its substance, but it has been found that by exposure to the sun for three days they get whiter wax.

Place on the fire a pot glazed on the interior, with a quantity of water, and when boiling introduce as much fruit as the pot will hold, and gather with a spoon the fat that rises to the surface of the water and allow it to cool until it coagulates, after which it is melted and filtered through a haircloth, with the result that the wax is clean and ready for use. The fruit remains in the boiling water until it has given up all its substance, which can be known when no oil rises to the surface, and then with fresh water and fruit the process is repeated.

This wax is brittle and no method for making it flexible has been discovered, so that it is worked with difficulty and the candles are liable to break. The wicks are fastened to strong sticks and bathed with the wax and guarded from the wind which will make them crooked, and while they are slime the bottom of each candle is pulled after each coating of wax to prevent their becoming crooked. (Cordova, Memorias de Puerto Rico, **1**: 240. 1831-1833)

Myristica fragrans. NUTMEG.

The true nutmeg is not known to have been introduced into Porto Rico, but the Spanish name for it "nuez moscado" is in common use for the seeds of a species of Nectandra, which serve as a substitute.

See note under nutmeg.

Myrodia turbinata. See *Quararibea turbinata.*

Myrospermum frutescens.

Family Viciaceae; a tree or shrub reported from near Utuado.

Myroxylon buxifolium. ROSETA.

A bixaceous shrub or tree, reaching a height of 8 to 10 meters; known from the vicinity of Peñuelas and Mayaguez.

Myroxylon pachyphyllum. See *Xylosma pachyphyllum* and note under *X. schwaneckeanum.*

Myroxylon schwaneckeanum. PALO DE CANDELA. See *Xylosma schwaneckeanum.*

Also called "palo colorado." A tree related to the "achiote" (*Bixa orellana*). It is described as from 5 to 8 meters in height, native in the Luquillo Mountains. (Urban, Add. **1**: 12.)

Myrsine coriacea. ARRAYAN.

A myrsinaceous shrub, 3 meters high found in mountains and waste places; collected by Sintenis at Adjuntas. (Stahl, **6**: 35.)

Myrsine floribunda. ARRAYAN.

A shrub 3 meters high, found in the mountains and waste places. (Stahl, **6**: 36.)

Myrsine guianensis.

A shrub reported from near Manati.

Myrtus acris. See *Amomis caryophyllata.*

Naguacatillo.

A tree about 60 feet (18 meters) in height, with light-green or greenish white wood, light and soft, but resistant. It is used in making boxes and tampions and for sheathing houses. Its fruit is used to feed hogs. (Grosourdy, **2**: 357.) Referred to *Nectandra leucantha* and *Laurus borbonia*, the former a Brazilian species, the latter a synonym of *Persea borbonia.*

Naranja. See *Citrus aurantium* and *C. bigaradia.*

The Spanish general term for the orange. In Porto Rico, however, it is applied only to the wild, sour orange, the sweet orange being called "china," or "naranja de china," or "china dulce."

Naranja china. See *Citrus aurantium.*

Naranja de china. See *Citrus aurantium.*

Naranjada.

A drink made from oranges, "orangeade."

Naranjillo.

A tree from all parts of the island: height, 25 to 30 feet (7 to 9 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood, white, hard; specific gravity, 0.743; not used. (Exp. 1857.)

Naranjo. See *Naranja.*

The orange tree in Spanish is "naranjo" or "naranjero," while the fruit is "naranja."

A tree from all parts of the island; height, 20 to 25 feet (6 or 7 meters); diameter, 9 to 10 inches (21 to 25 centimeters). Wood white, hard; specific gravity, 0.784; fruit tree. (Exp. 1857.)

Captain Hansard gives a specific gravity of 0.48 for the wood of the bitter orange, but this seems too light for so hard a wood.

Naseberry tree. See *Sapota achras.*

Nasturtium officinale. See *Rorippa nasturtium.*

Nectandra. ENEMOSCO.

Family Lauraceae. In Porto Rico the seeds of a species of Nectandra have been confused with those of *Monodora myristica*, the "calabash nutmeg," and also with the true nutmeg, *Myristica moschata.*

See note under Nutmeg.

Nectandra leucantha.

See note under Naguacatillo.

Neea buxifolia.

A nyctaginaceous shrub, reported from Fajardo.

Negra lora. MABA INCONSTANS.

Captain Hansard gives for this wood a specific gravity of 0.91.

A wild tree, 30 feet (9 meters) high, with a trunk 10 to 12 inches (25 to 30 centimeters) in diameter. The wood is flesh-colored, coarse, porous, and breaks with a vertical fracture. Its most common use is in building country houses and for fences. (Grosourdy. 2: 403.)

Negraz losa.

A tree from the interior of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood red, hard; specific gravity, 0.897; used in building houses. (Exp. 1857.) Probably the same as "negra lora."

Nephelium.

A genus of Sapindaceae, belonging to the Indian and Malayan region, and generally treated as including species which yield several important fruits, such as the "litchi," the "rambotan," and the "longan." *Litchi chinensis* has recently been recognized as generically distinct from Nephelium.

Nephelium litchi. See *Litchi chinensis.*

Nepsera aquatica. CAMACEY DE CIENEGA.

Family Melastomaceae; a small biennial shrub growing in clay or sandy soil subject to inundation. Of general distribution in tropical America. The generic name given by Stahl is Nespera, doubtless a typographical error. (Stahl, 4: 117.)

At Cataño this species is called "altea" and supposed to possess medicinal properties.

Neptunia plena. DESMANTO AMARILLO.

Family Mimosaceae; a slender herb, in sandy inundated places. (Stahl, 3: 141 as *Desmanthus plenus.*)

Nerium oleander. OLEANDER. ADELFA.

Family Apocynaceae. The common oleander is extensively planted in Porto Rico, as in other tropical countries, sometimes in the form of hedges. In some localities it has escaped from cultivation and grows apparently wild.

Nespera aquatica. See *Nepsera aquatica.*

Neurolaena lobata. SEPI.

An annual herbaceous composite growing as a weed in waste places. (Stahl, 5: 128, as *Neurolema lobata.*)

Neurolema lobata. See *Neurolaena lobata.*

This is probably a typographical error on the part of Stahl.

Niaragato. See *Fagara spinifex* and *Zanthoxylum tragodes.*

Nicotiana tabacum. TOBACCO.

Although only a small area is devoted to the culture of tobacco in Porto Rico, this crop ranks third among the exports of the island. The plant may be grown, indeed, in nearly all parts of the island, but there is only a limited area of the soil supposed to be adapted to the production of a marketable quality of leaf. The best tobacco, by general consent, is raised in the La Plata Valley above Cayey. Like nearly all the interior of the island the configuration of the country is extremely hilly, although, owing to the more friable nature of the soil, the slopes are not as steep as in many of the coffee-growing districts, and plowing can often be practiced. The underlying rock crumbles readily into small angular pieces, which, mingled with the finer superficial material, makes a loose, easily workable, deep-brownish soil. This is left in shallow furrows and ridges running along the slope. The rows are spaced at from 18 to 24 inches (45 to 60 centimeters), and the plants are set very close, only from 4 to 8 inches (10 to 20 centimeters) apart, there being no evidence of any serious attempt at regularity of distance.

The town of Cayey is the recognized center of the tobacco industry of the island, although the largest cigarette factories are located at Ponce and San Juan and many cigars are made in those and other cities and towns. In fact, cigar making is one of the largest of the domestic industries. All the men and boys smoke, of course, and many of the women are said to do so, although only those of the lower classes are seen indulging themselves in public. The home consumption of cigarettes must be enormous, since the Porto Rican, whether at work or at leisure, is seldom long without one, even though the cigar may be only an occasional indulgence. The Porto Rican cigarette is not, however, the medicated nuisance prevalent in the United States, but the general use of tobacco by the growing boys probably has its effect in increasing the debility of the population.

A peculiar type of black plug tobacco is also offered for sale in the market, in the form of large rolls variously and ingeniously coiled. Although fruits and vegetables are sold by weight in Porto Rico, this tobacco is retailed by linear measure.

No such careful methods of cultivation or selection have been practiced in Porto Rico as in Cuba, and the possibilities of the island will not be adequately known until careful experiments have been made under test conditions. It has been demonstrated by the experiments of Dr. Loew that the processes of curing are all important in the determination of the quality of tobacco. It has been stated, with what warrant is not known, that the Porto Rican growers are not acquainted with the Cuban methods and do not practice a uniform system of curing. If this be the case, it is not impossible that the introduction of the popular processes may render the Porto Rican crop of the very first quality.

In Cuba and other regions furnishing high-grade tobacco the crop is not only assorted by localities, but the leaves even from different parts of the same plant are separated into several classes, some of superlative quality. In Porto Rico the manufacturers uniformly declare that they handle only one grade of tobacco, and that the differences in the prices of their various classes of cigars represent merely the varying cost of labor and packing.

Nigua. See *Tournefortia hirsutissima.*

Several other species of Tournefortia are also known under this name, though Stahl proposes distinctive terms for the different species. A root called "nigua" was on sale in the market of Ponce as an ingredient of a refreshing drink.

Nigua de playa. See *Tournefortia gnaphalodes.*

Nigua-enredadera. See *Tournefortia volubilis.*

Nigua fetida. See *Tournefortia foetidissima.*

Nigua-hoja-laurel. See *Tournefortia laurifolia.*

Nigua peluda. See *Tournefortia hirsutissima.*

Niguita. See *Tournefortia laevigata.*

Niño de cota. See *Haemocharis portoricensis.*

Níspero. See *Achras sapota.*

This is the Spanish name for the Japanese medlar or loquat (*Eriobotrya japonica*), but in Porto Rico it is universally applied to *Achras sapota*, elsewhere called "sapote" or "sapodilla." Captain Hansard gives a specific gravity of 1.02 for the "sapadilla" or "nispero" wood.

Níspero cimarron. See *Symplocos lanata.*

Níspero de España. See *Eriobotrya japonica.*

Níspero was originally the Spanish for *Mespilus germanica*, but was transferred to the loquat when that was introduced. In Porto Rico the use of "níspero" for the sapodilla has resulted in the explanatory "de España" for the Japanese species.

No-eye pea. See *Cajanus cajan.*

Nopalea coccinellifera. TUNA MANSA. PLATE XLVII.

This is generally reported to be a spineless cactus on which the cochineal insect is raised. In the Canary Islands, however, where there is a considerable cochineal industry, the cacti employed are by no means spineless, and are apparently the plant usually designated by botanists as *Opuntia ficus-indica.* Nopalea is reported from Porto Rico by Stahl (**4**: 190) as *Opuntia coccinellifera.*

Norfolk Island Pine. See *Araucaria excelsa.*

Noyó. See *Ipomoea dissecta.*

Nues. (Probably a misspelling of "Nuez.")

A tree from the interior of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 20 to 25 inches (50 to 63 centimeters). Wood, red, hard; specific gravity, 0.654; used for making furniture. (Exp. 1857.)

Nuez. See *Juglans cinerea.*

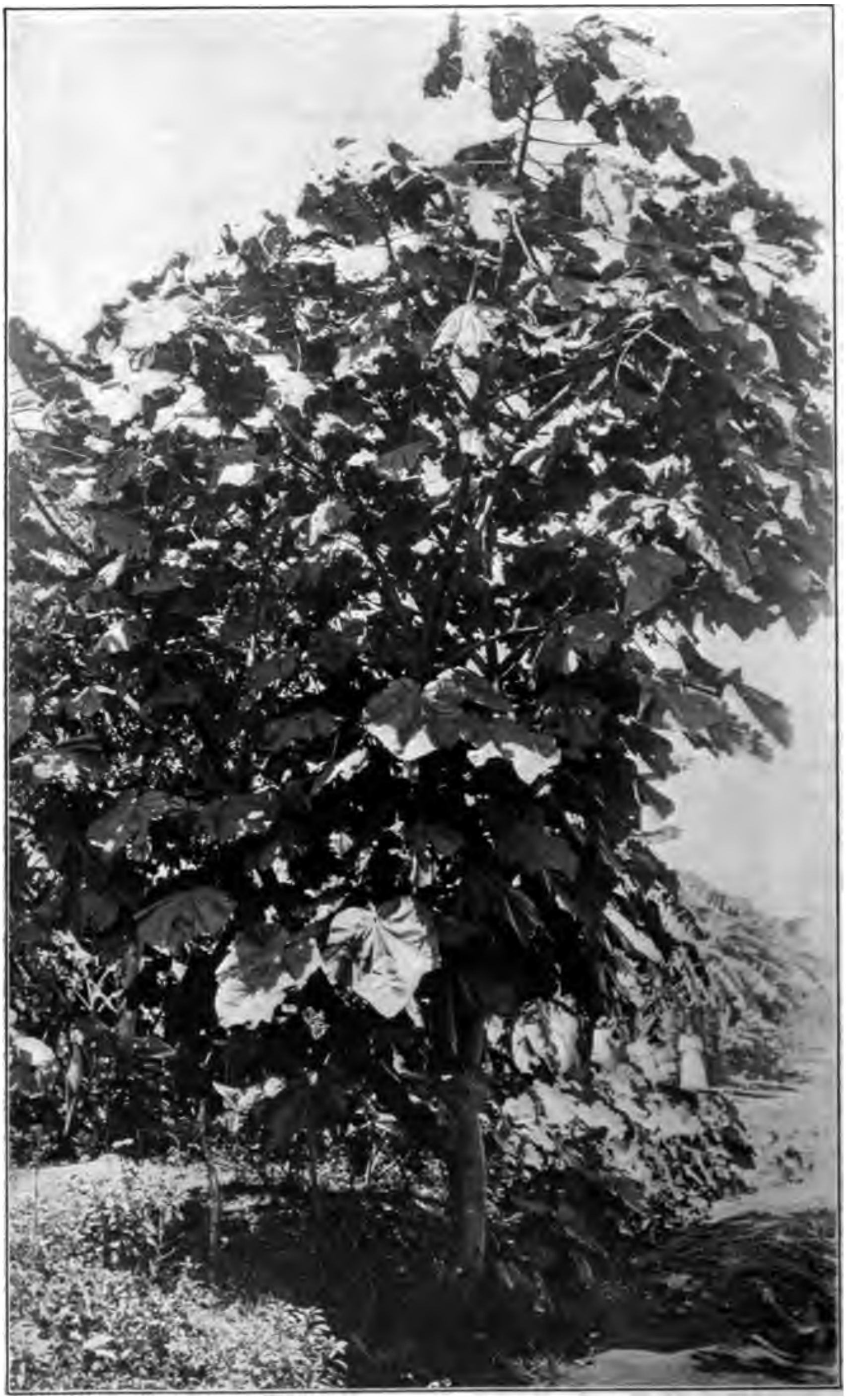
The Spanish name for the fruit of the common walnut.

Nunguey.

On sale at the market of Ponce; said to be the root of a tree; used with sugar and water in the preparation of a refreshing drink.

Nutmeg.

Many attempts have been made to render the cultivation of the nutmeg a commercial industry in various parts of South America and the West Indies, but with uniformly discouraging results, excepting in the volcanic island of Grenada, at the extreme southern end of the Windward chain. Grenada lies out of the track of



CORK WOOD (OCHROMA LAGOPUS). NEAR PONCE.

the hurricanes, is not subject to the dry seasons, and appears to possess all the requirements for the successful growth of this spice. The geological and climatic conditions are, however, very different from those of Porto Rico, and while it is too early, perhaps, to say that the nutmeg can not be profitably cultivated in any part of that island, it is safe to say that the probabilities of success are slight and that extensive planting would be inadvisable until a careful investigation of any proposed locality has been made.

According to several published works the nutmeg is a common tree in Porto Rico, but these references are to be understood as applying to a species of Nectandra, the seeds of which are in common use and sold in the markets as "nuez moscado," or nutmeg, which the general public firmly believe them to be. The seeds may be distinguished at once from the genuine article by their smaller size and more slender shape and from the fact that the two halves readily fall apart.

Nymphaea. See *Castalia.*

Ochra. See *Abelmoschus esculentus.*

Ochroma lagopus. GUANO. CORKWOOD. PLATE XLVII.

Family Bombacaceae; a tree rising to the height of 60 or 70 feet (18 to 21 meters) and sometimes 6 feet in circumference. The wood is soft on account of the rapid growth of the tree, and is used for corks by fishermen, etc. The fiber enveloping the seeds is used to make pillows and mattresses, and may be made into garments. Reported from Manati. In Jamaica called "down tree." (Stahl, **2**: 100.)

A wild tree, rather abundant, 30 to 40 feet (9 to 12 meters) high, 1 foot (30 centimeters) or more in diameter. The wood is white, stained with red, luminous in aspect, sometimes silky. It is very porous, and the lightest of all woods, lighter even than true cork, the specific gravity of which is 0.240, while the latter is 0.120; fibrous and very difficult to work, because of the fibers that impede the action of the tools. In Trinidad and other places it forms an article of commerce with fishermen, who use it in place of true cork on their nets. The Indians use it to make their canoes buoyant. Called "corcho." (Grosourdy, **2**: 376.)

Ochroma is said to be shipped in quantities to Cuba. The bark and roots have medicinal properties. The fiber is chestnut-colored. It is said to keep free from insects. Sold at 20 cents per pound.

Ocimum americanum. ALBAHACA CIMARRONA.

An indigenous annual of the mint family. (Stahl, **6**: 190.)

Ocimum basilicum. BASIL. ALBAHACA.

An herbaceous annual or biennial, cultivated in gardens, 40 centimeters high, said to grow spontaneously in Jamaica, where it is called by its English name, "basil." (Stahl, **6**: 188.)

Ocimum micranthum. ALBAHACA CIMARRONA.

An erect woody biennial, 50 centimeters high, found in cultivated fields near forests. (Stahl, **6**: 189.)

Ocotea moschata.

Family Lauraceae; reported from Adjuntas.

Ogiera ruderalis. See *Eleutheranthera ovata.*

Ojo de buey. See *Mucuna urens.*

Okra. See *Abelmoschus esculentus.*

Oldenlandia corymbosa. YERBA OLDENLANDIA.

A slender rubiaceous herb; a weed in cane fields. (Stahl, **5**: 53.)

Oldenlandia glomerata. GRACIOSA.

An herbaceous annual, 25 centimeters high. (Stahl, **5**: 52, as *Hedyotis glomerata.*)

Oldenlandia herbacea. See *Oldenlandia corymbosa.*

Olea europaea. OLIVE. ACEITUNA.

Olive culture is one of the new industries which has been suggested for Porto Rico. The olive is native to the dry climate of the desert regions about the Mediterranean. It has also been successfully introduced into similiar situations in southern California and Arizona. In Florida, however, owing doubtless to the more moist atmosphere, the production of fruit has been found impossible, although the trees vegetate with apparent vigor. Under the more tropical conditions of Porto Rico, with a warmer and more moist atmosphere, there is still less probability of the production of fruit, to say nothing of securing it in commercial quantities and of superior quality, as would be necessary in order for it to become an export crop able to compete with established industries. An experiment in the driest localities on the south side of the island might be worth while from the scientific standpoint, but the general planting of olives in the hope of establishing an industry which might be substituted for those now in distress could result only in more complete disaster.

Oleander. See *Nerium oleander.*

Olive. See *Olea europea.*

Olive mangrove. See *Avicennia nitida*

Onion. See *Allium cepa.* PLATE XLVIII.

Opuntia.

A large genus of Cactaceae, with numerous representatives in Porto Rico. About Guayanilla the members of this genus are very abundant, forming almost a forest in some places.

Opuntia coccinellifera. See *Nopalea coccinellifera.*

Opuntia decumbens. OTAGA.

A cactus abundant on the southern and eastern coasts. (Stahl, 4: 190.)

Opuntia guanica.

A small indigenous species recently described by Professor Schumann, of Berlin.

Opuntia repens.

Known from near Guanica.

Opuntia tuna. TUNA BRAVA.

The identity of this cactus seems to be very uncertain. Some botanists have confused it with the species usually called *Opuntia ficus-indica.*

Orange, Wild. See *Naranjo.*

Mr. Hill says the wild or Seville orange in the country is an indigenous tree. Numerous seedling varieties of oranges and other citrus fruits have escaped from cultivation and are to be found in unexpected places in all parts of the island. No species of citrus is, however, supposed by botanists to be indigenous in Porto Rico or in any part of the American continents or islands.

Orchata.

A drink said to be made from the "sweetened and diluted milk of almonds." In view of the prevalent belief that the nuts of *Terminalia catappa* are "almendras," this statement should probably be understood as referring to that species rather than to imported nuts.

Oreganillo. See *Eupatorium villosum.*

Oregano.

Leaves sold in the market of Ponce; used for seasoning food.

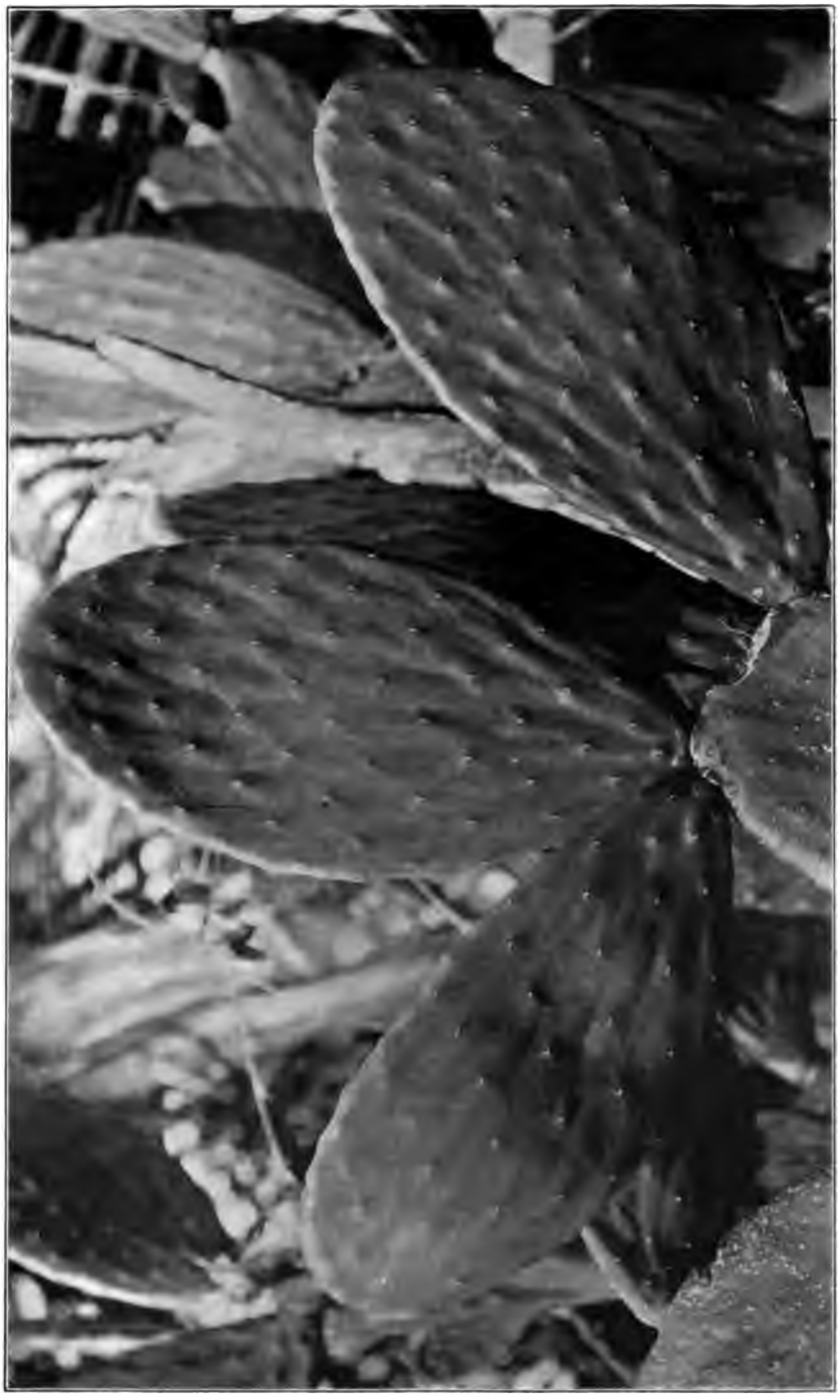
Oregano brujo. See *Coleus aromaticus.*

Oregano de España. See *Coleus aromaticus.*

Oregano del pais. See *Lippia micromera.*

Oreodoxa. See *Roystonea.*

PLATE XLVIII.



SPINELESS OPUNTIA. NEAR GUAYAMA.

Oreodoxa regia. See *Roystonea regia.*

Oreopanax capitatum. PALO CACHUMBA.

Family Araliaceae; a shrub, 4 meters high, on hills near Coamo. (Stahl, 4: 198, as *Aciadophyllum capitatum.*)

Ormosia dasycarpa. PALO DE MATOS.

Family Viciaceae; a tree, 10 meters high, in mountains. Wood of good quality. (Stahl, 3: 99.)

Ormosia krugii. PALO DE MATOS.

A leguminous tree of 10 to 25 meters, known only from Porto Rico and Dominica. Specimens in the National Herbarium, collected by Sintenis, near Juncos, show the wood to be light and pithy. The leaves are very large, about 20 inches (50 centimeters) long, and the pods are brown and leathery, containing from one to three red and black beans. Another specimen from Mount Françis, Sierra de las Piedras, has much smaller, closely veined leaves, more densely pubescent on the under side.

Orosne. See *Polygala paniculata.*

Orozuz. See *Scoparia dulcis.*

Ortegon. See *Coccolobis rugosa.*

Ortelá. See *Marsypianthes hyptoides.*

Ortiga.

An ingredient for a refreshing drink, on sale by a herb dealer in the market of Ponce. Said to be derived from a tree; perhaps ortegon.

Oryza sativa. RICE.

Very little rice is now grown in Porto Rico, and this is planted without irrigation in ordinary fields, such as we might use for wheat. A considerable quantity is, however, imported from the East Indies, largely by way of Germany and Spain. The question has been raised as to whether the low grade and broken rice produced in our Southern States might not be advantageously utilized in Porto Rico, and there seems to be every probability that considerable quantities would find a ready market. In the United States rice is seldom treated as a staple article of food, but is looked upon merely as an accessory dish or dessert, for which fancy prices are readily paid. This, however, excludes from the market all of the broken kernels and lower grades. The food value of these is, however, quite as great as that of the higher-priced article, and there is a large class in Porto Rico which might be expected to avail itself of a cheap but wholesome article of this kind.

Ossea fascicularis. See *Henriettella fascicularis.*

Otaga. See *Opuntia decumbens.*

Otaheite apple. See *Eugenia malaccensis.*

Otaheite gooseberry. See *Cicca disticha.*

Ouratea litoralis.

A shrub or small tree 2 to 5 meters high, belonging to the family Ochnaceae. Reported from thickets and sandy beaches, Cangrejos, Bayamon, Fajardo, Yubacoa, and Manati. (Urban, Symb. 1: 363.)

Ouratea nitida. GONFIA LUSTROSA.

A shrub or tree with the same habitat and dimensions as the preceding. (Stahl, 2: 120, as *Gomphia nitida.*)

Oxalis corniculata. VINAGRILLO.

Family Oxalidaceae; a herbaceous annual, preferring stony places, rather shaded and wet. (Stahl, 2: 169.)

Oxalis corymbosa. VINAGRILLO MORADO.

A herbaceous plant, cultivated in gardens. (Stahl, 2: 170, as *Oxalis martiana.*)

Oxalis frutescens. VINAGRILLO.

A low, tortuous shrub. (Stahl, **2:** 170.)

Oxalis martiana. See *Oxalis corymbosa.*

Oxandra laurifolia. HAYA BLANCA.

An indigenous anonaceous tree, reported by Bello; also called "yaya." It reaches a height of 30 feet (9 meters), and fruits in January. (Stahl, **2:** 28.)

Oxandra virgata. HAYA PRIETA.

An indigenous tree, originally described from Cuba.

Pacholi.

The strongly aromatic roots of a grass, perhaps *Andropogon nardus*, were on sale in small bundles in the market of Ponce. They are put in chests to keep out moths.

Pachyrrhizus angulatus. YAM BEAN. FRIJOLILLO DE ÑAME.

A shrubby, leguminous vine, having thickened horizontal roots, several inches in diameter, and 6 to 8 feet (2 to 2.5 meters) long. Although edible, these roots are inferior to the true yam "cassava," or "taro," and when cooked they are said to resemble turnips in texture and taste. In some countries they form a resource in times of scarcity resulting from the failure of the usual crops. In Porto Rico this species was observed only in the vicinity of Rio Piedras, though it doubtless exists in other parts of the island. (Stahl, **3:** 70.)

Pachyrrhizus tuberosus. YAM BEAN.

A leguminous vine with large edible roots; reported from Rincon

Pacyrrizus angulatus. See *Pachyrrhizus angulatus.*

Pajuil. See *Anacardium occidentale.*

A tree from all parts of the island; height, 12 to 15 feet (3.5 to 4 meters); diameter, 9 to 10 inches (22 to 25 millimeters). Wood pinkish, soft; specific gravity, 0.550; fruit tree. (Exp. 1857.)

Palm.

The palms thus far reported from Porto Rico are as follows:

Phoenix dactylifera (date palm), *Inodes causiarum* (Porto Rican hat palm), *Thrinax praeceps*, *Thrinax ponceana*, *Thrincoma alta*, *Thringis laxa*, *Thringis latifrons*, *Aeria attenuata* (llume), *Areca catechu* (Betel nut palm), *Roystonea borinquena* (Royal palm), *Acrista monticola* (Palma de Sierra), *Bactris acanthophylla*, *Bactris pavoniana*, *Curima calophylla* (coyure), *Acrocomia media* (corozo), *Cocos nucifera*, and *Cocops rivalis*.

A synopsis of the above species appeared in the Bulletin of the Torrey Botanical Club for October, 1901.

Palicourea barbinervis.

Family Rubiaceae; reported from Lares and Anones. Bello gives the common name "tafetan."

Palicourea coccinea.

Reported from Aibonito.

Palicourea crocea. CACHIMBO.

A biennial shrub, 1 to 2 meters high, found in waste places; known from Lares. (Stahl, **5:** 77.)

Wood light-colored, soft; specific gravity, 0.482; not used. (Exp. 1857.)

Palicourea pavetta.

A shrub 6 feet (1.8 meters) high; known from Juncos, on Mount Goyo.

Palicourea umbellata. CACHIMBO VERDE.

A biennial shrub, 1 meter high, found at the base of mountains. (Stahl, **5:** 78.)

Palma christi. See *Ricinus communis.*

Palma costa. See *Roystonea borinquena.*

A name applied to the royal palm in the vicinity of Coamo.

Palma de grana. See *Roystonea borinquena.*

Palma de la Sierra. See *Acrista monticola.*

Palma de los cerdos. See *Roystonea borinquena.*

This means "pig palm," and is one of the names applied to the royal palm on the south side of the island.

Palma mauricia. See *Mauritia flexuosa.*

A Cuban name, also said to be applied to *Mauritia setifera* (*setigera?*).

Palma moriche. See *Mauritia flexuosa.*

Palma real. See *Roystonea borinquena.*

Palmetto. See *Sabal* and *Thrinax.*

Palo blanco. See *Drypetes glauca.*

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood white, soft; specific gravity, 0.866; used in building houses. (Exp. 1857).

Captain Hansard gives the specific gravity as 0.77. Used in hut building.

Palo bobo. See *Coccolobis diversifolia* and *Pisonia subcordata.*

A tree from all parts of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood white, very soft; specific gravity, 0.531; not used. (Exp. 1857).

Captain Hansard gives the specific gravity at 0.54.

Palo bronco. See *Malpighia urens.*

Palo cachumba. See *Gilibertia arborea*, *G. laurifolia*, and *Oreopanax capitatum.*

Palo cano.

A tree from all parts of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood white, hard; specific gravity, 0.990; not used. (Exp. 1857).

Palo colorado. See *Myroxylon schwaneckeanum* and *Ternstroemia luquillensis.*

Palo de aceite. See *Copaifera officinalis.*

Palo de boyo. See *Erythrina micropteryx.*

Palo de Brasilete. See *Dalbergia monetaria.*

Palo de burro. See *Capparis cynophallophora*, *C. frondosa*, *C. latifolia*, and *C. verrucosa.*

Palo de cabra. See *Symplocos polyantha.*

Palo de Campeche. See *Haematoxylon campechianum.*

Palo de candela. See *Myroxylon schwaneckeanum.*

Palo de corcho. See *Pisonia obtusata.*

Palo de cucubano. See *Guettarda scabra.*

Palo de doncella. See *Byrsonima lucida.*

Palo de galleria.

A tree from all parts of the island; height, 25 to 30 feet (8 to 9 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood white, soft; specific gravity, 0.409; used in building houses. (Exp. 1857.)

Palo de gallina. See *Alchorneopsis portoricensis.*

Palo de gangulin. See *Gilibertia laurifolia.*

Palo de garrocha. See *Quararibea turbinata.*

Palo de guitarra. See *Citharexylum quadrangulare.*

Palo de hierro. See *Ixora ferrea*, *Sarcomphalus reticulatus*, and *Scutia ferrea.*

Captain Hansard gives the specific gravity of this wood as 1.07.

Palo de hoz. See *Drepanocarpus lunatus.*

Palo de hueso. See *Ilex nitida*, *Linociera compacta*, and *Mayepea domingensis.*

Palo de jaqueca. See *Thespesia populnea.*

Palo de Maria. See *Calophyllum calaba.*

Palo de matos. See *Ormosia dasycarpa* and *O. krugii.*

Palo de multa. See *Eugenia ligustrina.*

Palo de muñeca. See *Cordia borinquensis* and *Rauwolfia nitida.*

Palo de níspero cimarron. See *Symplocos lanata.*

Palo de oreja. See *Cassipourea elliptica.*

Palo de pan cimarron. See *Bocconia frutescens.*

Palo de perico. See *Cordia ulmifolia.*

Palo de peronias. See *Adenanthera pavonina.*

Palo de pollo. See *Pterocarpus draco.*

Palo de ramon. See *Banara portoricensis.*

Palo de rayo. See *Parkinsonia aculeata.*

Palo de toro. See *Faramea odoratissima.*

Palo de vaca. See *Gilibertia laurifolia.*

Palo de geringa. See *Moringa moringa.*

Palo hediondo. See *Lonchocarpus latifolius.*

Palo hueso.

A tree from the northeastern part of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood olive green, hard; specific gravity 1.029; used in making shelves. (Exp. 1857.)

Grousourdy (2: 407) describes the wood as dirty white, and says that it is used for fuel and the framework of rude houses.

Palo llorón. See *Antirrhoea lucida* and *Malanea macrophylla.*

Palo moro. See *Psychotria.*

This name is applied to numerous species of this very large genus of Rubiaceae.

Palo pollo. See *Pterocarpus draco.*

A tree from the swampy parts of the island; height, 35 to 40 feet (11 to 12 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood white, soft; specific gravity 0.614; not used. (Exp. 1857.)

Grows to a considerable height and attains great thickness; very irregular at base; wood used for handles for machetes and pans for gold miners; texture hard and solid.

Palo puerco.

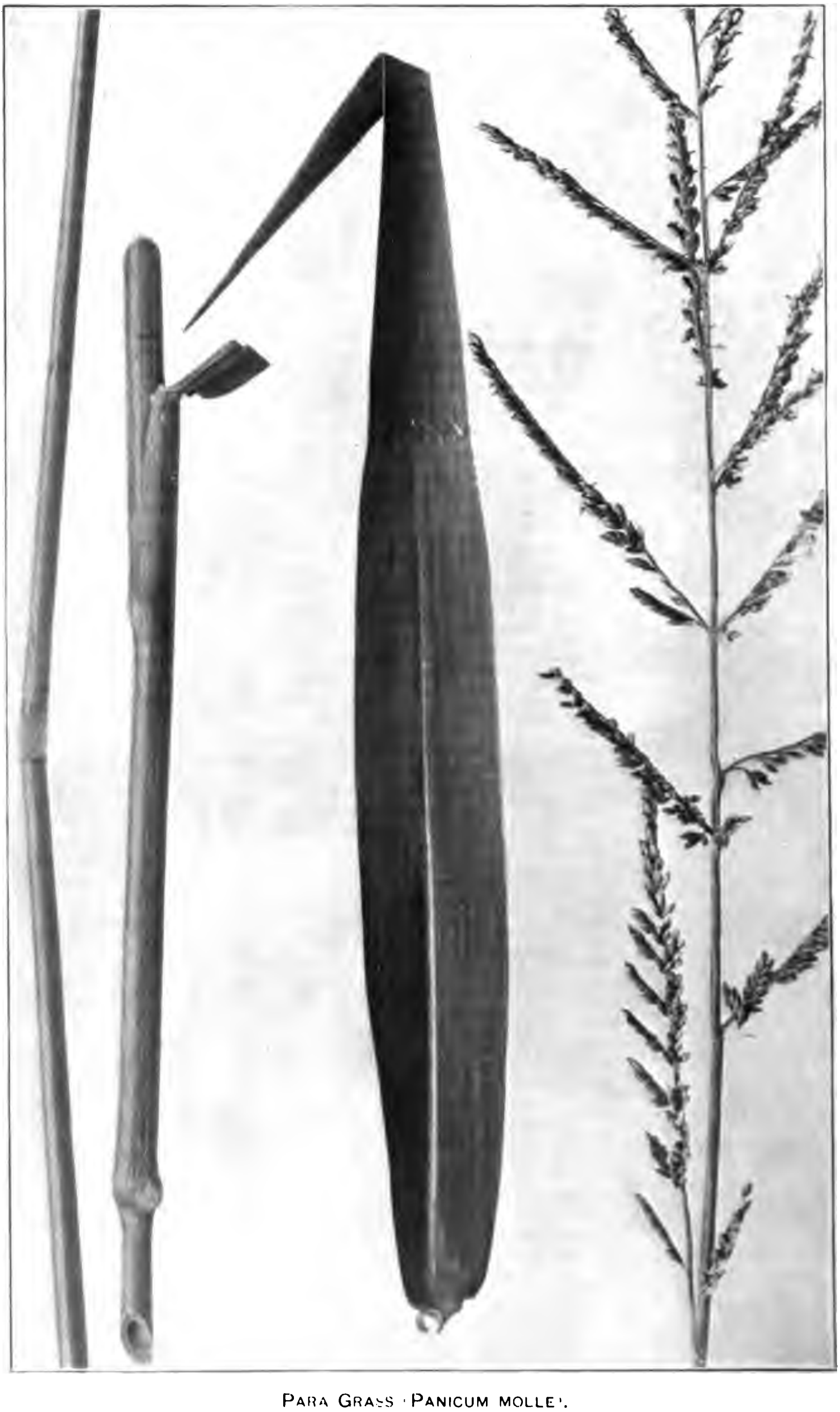
Captain Hansard gives a specific gravity of 0.87 for this wood, but says that he does not know the tree.

Palo punz.

A tree from all parts of the island; height, 25 to 30 feet (8 to 9 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood ash-colored, soft; specific gravity 0.725; used in building houses. Also called "palo santo." (Exp. 1857.)

Palo rosa.

A tree from the island of Vieques; height, 25 to 30 feet (7 to 9 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood pinkish, hard; specific gravity, 0.994; used in building houses. (Exp. 1857.)



PARA GRASS (PANICUM MOLLE).

Palo santo. See *Palo punz.*

A wild tree 30 feet (9 meters) or more in height, with a trunk 8 to 12 inches (20 to 30 centimeters) in diameter. Furnishes a soft ash-colored wood that breaks with a vertical fracture. Used in building houses and fences. (Grosourdy, 2: 407.)

Captain Hansard gives 0.70 as the specific gravity of this wood.

Pana. See *Gilibertia arborea.*

Pana cimarrona. See *Didymopanax morototoni.*

Panales.

Small froth-like rolls made of sugar and white of egg. They are not for eating, but are dissolved in water to make a sweetish drink.

Panicum maximum. GUINEA GRASS. YERBA DE GUINEA.

The guinea grass is said to have been used as bedding in the slave ships, and to have become established in tropical America accidentally after floating ashore from the rubbish thrown overboard when the ships were unloaded. The origin of this account should be traced as a note on plant introduction.

Panicum molle. PARA GRASS. MALOJILLO. PLATE XLIX.

As a pasture grass this species is second only to the Guinea or "yerba de Guinea." It is grown in the swampy meadows of the north coast and wherever the ground is too moist for the latter species.

The Malojillo is deep green in color, decumbent at base, with very hairy joints. The flower stalk has fewer and shorter branches than the Guinea grass. Both species produce luxuriant crops, but both seem too coarse to represent the food value of the same amount of the temperate grasses.

Papa. See *Solanum tuberosum.*

Papaw. See *Carica papaya.*

Papaya. See *Carica papaya.*

This is a cultivated fruit, not a mountain forest tree as stated by Hill.

Papaya lechosa. See *Carica papaya.*

Para grass. See *Panicum molle.*

Paralejo velludo. See *Heteropteris laurifolia.*

Parasita. See *Dendropremon bicolor.*

Parathesis crenulata. See *Seca-garganta.*

Family Myrsinaceae; an erect shrub, 1 to 2 meters high, on the sides of ravines. Bello gives the common name "rasca garganta." (Stahl, 6: 37, as *Ardisia crenulata.*)

Parcha. See *Passiflora laurifolia.*

Parcha augosta. See *Passiflora suberosa.*

Parcha cimarrona. See *Passiflora maliformis.*

Parcha colorada. See *Passiflora rubra.*

Parcha de garjos. See *Passiflora serrata.*

Parcha multiflora. See *Passiflora multiflora.*

Parcha ojillosa. See *Passiflora tulae.*

Parcha palida. See *Passiflora suberosa.*

Parcha pelitiesa. See *Passiflora suberosa.*

Parcha yedra. See *Passiflora suberosa.*

Paritium elatum. See *Hibiscus elatus.*

Paritium tiliaceum. EMAJAGUA. PLATE L.

A large shrub or small tree widely distributed throughout the warm regions of the Old and New worlds. It was in use throughout tropical America before the advent of Europeans, and is still one of the most important fiber plants for local and domestic uses. The bast furnishes a strong and flexible fiber, comparable to jute, and having the remarkable quality of becoming stronger by long maceration in water. Although this has been known for many years, and although the plant would grow readily and without cultivation in moist waste tracts common along the coasts of many tropical countries, there seems to have been no serious attempt at introducing the fiber to commerce or adapting it to civilized uses.

The oft-quoted experiment of Roxburgh, as reported by Watt, is as follows:

> "A line broke when white with a weight of 41 pounds; after being tanned, with 62 pounds, and after having been tarred, with 61 pounds. A similar line macerated in water for one hundred and sixteen days broke when white with 40 pounds; tanned, 55 pounds, and tarred, 70 pounds. These observations are of great interest, for of the other fibers experimented with by Roxburgh, the majority were rotten after maceration, and no other fiber showed so marked an improvement for cordage purposes when tarred. English hemp and Indian grown hemp, treated in the same manner, were found to be rotten, and sunn-hemp broke with 65 pounds and jute with 60 pounds. The power of endurance under water is, therefore, a point of great importance.
>
> "The fiber is readily separated from the green or unsteeped branches, the work of preparation being less tedious than applies to the other fiber-yielding plants of this genus. It appears to be well adapted for making ropes, mats, and possibly paper (*Cameron*). The fiber seems highly suitable for the paper trade, and immense quantities of it might be conveyed in boats to the paper mills of Bengal."

The last suggestion of paper making would seem to be worthy of investigation by our manufacturers in view of the increasing scarcity of raw materials for a product of good quality. Emajagua could be produced with extreme cheapness. Replanting would not be necessary, as sprouts come up abundantly from the stumps. Cultivation could be carried on after the manner of the basket osiers.

In Porto Rico nearly all the ropes in use are made from emajagua.

Recommended in Jamaica by Dr. Morris for windbreaks about cacao plantations.

Also called "Majagua."

Parkinsonia aculeata. JERUSALEM THORN. PALO DE RAYO.

A leguminous tree related to the Haematoxylon or logwood. It is supposed to be native in some parts of the American continent, but is now so generally cultivated that the original habitat is in doubt. (Stahl, **3**: 119.)

Parra cimarrona. See *Vitis caribaea*.

Parthenium hysterophorus. AJENJO CIMARRON.

An herbaceous annual composite, found in sandy places. In Jamaica this plant is called "mugwort" and Lunan gives a number of cases in which it was supposed to have curative value in healing different kinds of eruptive diseases. (Stahl, **5**: 157.)

Pascueta. See *Erigeron canadensis*.

Pascueta amarilla. See *Erigeron rivularis*.

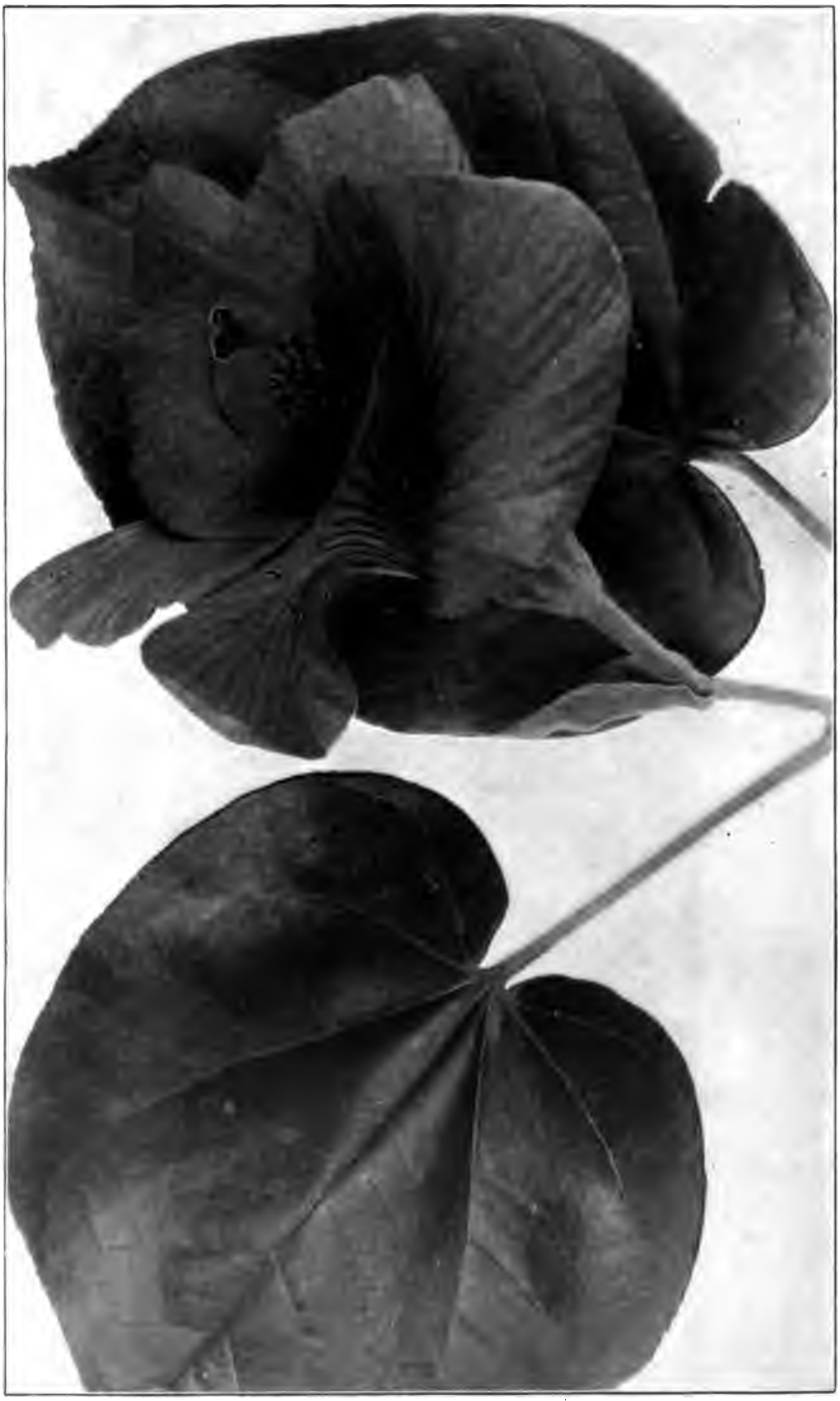
Passiflora angustifolia. See *Passiflora suberosa*.

Passiflora foetida. TAGUA-TAGUA.

Family Passifloraceae: a shrubby vine found along roadsides. It has a disagreeable odor, but the flowers are beautiful and the fruit edible; called "love in a mist" in Jamaica. (Stahl, **4**: 144.)

Passiflora hoderaceae. See *Passiflora suberosa*.

Passiflora hirsuta. See *Passiflora suberosa*.



EMAJAGUA (PARITIUM TILIACEUM).

Passiflora laurifolia. PARCHA.

A woody twining climber, cultivated in gardens; fruit tart and agreeable. (Stahl, 4: 147.)

Passiflora maliformis. PARCHA CIMARRONA.

A woody climber, found in waste places. Reported from Utuado. (Stahl, 4: 148.)

Passiflora multiflora. PARCHA MULTIFLORA.

The velvety-pubescent long-oval leaves seem characteristic among the Porto Rican species; collected by Sintenis at Manati.

Passiflora pallida. See *Passiflora suberosa.*

Passiflora quadrangularis. GRANADILLA.

A twining vine, cultivated in gardens as an ornamental; used for covering arbors. Fruits agreeable. The pulp mixed with water and sugar makes a refreshing drink. (Stahl, 4: 145.)

Passiflora rubra. PARCHA COLORADA.

An herbaceous vine found in waste places. (Stahl, 4: 150.)

Passiflora serrata. PARCHA DE GARJOS.

A vine found in waste places and mountains. (Stahl, 4: 149.)

Passiflora suberosa.

According to the Kew Index, Stahl's species of *Passiflora angustiflora* "parcha angosta," *P. pallida* "parcha palida," *P. hirsuta* "parcha pelitiesa," and *P. hederacea* "parcha yedra" are included in *Passiflora suberosa.*

Grows to a height of 20 feet (6 meters). Reported from Yarbuco and Guanica.

Passiflora tulae. PARCHA OJILLOSA.

An indigenous species recently described by Urban as new. It is *Murucuja ocellata* of Bello and *Passiflora murucuja* of Stahl, called "bull hoof" in Jamaica. (Stahl, 4: 151, as *Passiflora murucuja.*)

Pata de cabra.

These samples [pata de cabra and algarrobo] are so similar in detail of structure as to be from the same or closely related species. Color, rich blackish brown, irregularly mottled, and streaked with areas of pale reddish brown; sapwood (present in pata de caba), light brown. Ducts conspicuous, occurring singly or two together, between two medullary rays or often interrupting a ray; evenly diffused. Medullary rays conspicuous, visible to the naked eye, often disconnected. Wood fibers strongly interlaced, giving smoothed surface a "curled" appearance. Very attractive cabinet woods. Resemble forms of mesquit, especially *Prosopis odorata.* (Hill and Sudworth.)

Pata de gallina. See *Phoradendron chrysocarpum.*

Patata. See *Solanum tuberosum.*

Patilla. See *Citrullus vulgaris.*

Paullinia pinnata. BEJUCO PRIETO.

Also called bejuco de costilla. Family Sapindaceae; a woody climber with compound leaves and a winged rhachis like that of *Inga vera.* It climbs by means of tendrils attached to the flower cluster. According to the Index Kewensis this name is a synonym of *Serjania curassavica.* (Stahl, 2: 155.)

Pavonia. See *Hibiscus rosa-sinensis.*

Pavonia coccinea. CADILLO ANARANJADO.

Family Malvaceae; a woody herb, 1 meter high. (Stahl, 2: 85.)

Pavonia encendida. See *Hibiscus radiatus.*

Pavonia racemosa. CADILLO DE CIÉNEGA.

A shrub 2 to 3 meters high, frequenting mangrove swamps. (Stahl, 2: 84.)

Pavonia spinifex. CADILLO ESPINOSO.

An annual or biennial shrub, 1 to 2 meters high, found on mountains and in shaded places. (Stahl, 2: 83.)

Pavonia typhalea. CADILLO PEQUEQUE.

A shrubby annual, growing in shaded wet places. The small white flowers are collected in a head and give an appearance quite different from related members of the Malvaceae. Specimens collected at El Rio were called "anamu" and were reputed a remedy for chigoes. (Stahl, 2: 81.)

Paw paw. See *Carica papaya.*

Peanut. See *Arachis hypogea.*

Pectis humifusa. YERBA DE SAN JUAN.

A woody annual composite from sandy seashores. (Stahl, 5: 145.)

Pectis serpyllifolia. See *Pectis humifusa.*

Pedilanthus tithymaloides.

A peculiar fleshy Euphorbiaceous plant, with an irregular wing along the midrib on the lower side of the leaves. Frequently planted for hedges.

Pegadora. See *Mentzelia aspera.*

Pega-palma. See *Marcgravia umbellata.*

Pega-pega.

This name meaning "stick-stick," like our "stick-tight," is probably applied to several seeds adapted for attaching themselves to one's clothes, as "pica-pica" is used for many spiny plants.

At Santurce *Priva echinata* and *Aeschynomene americana* were called "pega-pega."

Pega-palo. See *Bignonia unguis-cati.*

Pega pollo. See *Boerhavia scandens.*

Pegoge. See *Tabernaemontana citrifolia.*

Peireskia.

Family Cactaceae; a thick, spiny shrub or small tree, valuable mostly as a stock on which to graft the various cacti. Known from specimens collected by Sintenis at Penuelas, where it was cultivated in gardens.

Penaejuelo.

A tree from the northeastern part of the island; height, 45 to 50 feet (13 to 15 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood, ash-colored; rather hard; specific gravity, 0.810; used for lumber. (Exp. 1857.)

Pendejuelo.

Evidently the same as Penaejuelo.

A wild tree, 50 feet (15 meters) high, with a trunk reaching a diameter of 18 inches (45 centimeters). Furnishes an ash-colored wood that breaks with an oblique fracture. Its common use is for lumber used in building crude houses. (Grousourdy, 2: 408.)

Péndola. See *Citharexylum quadrangulare.*

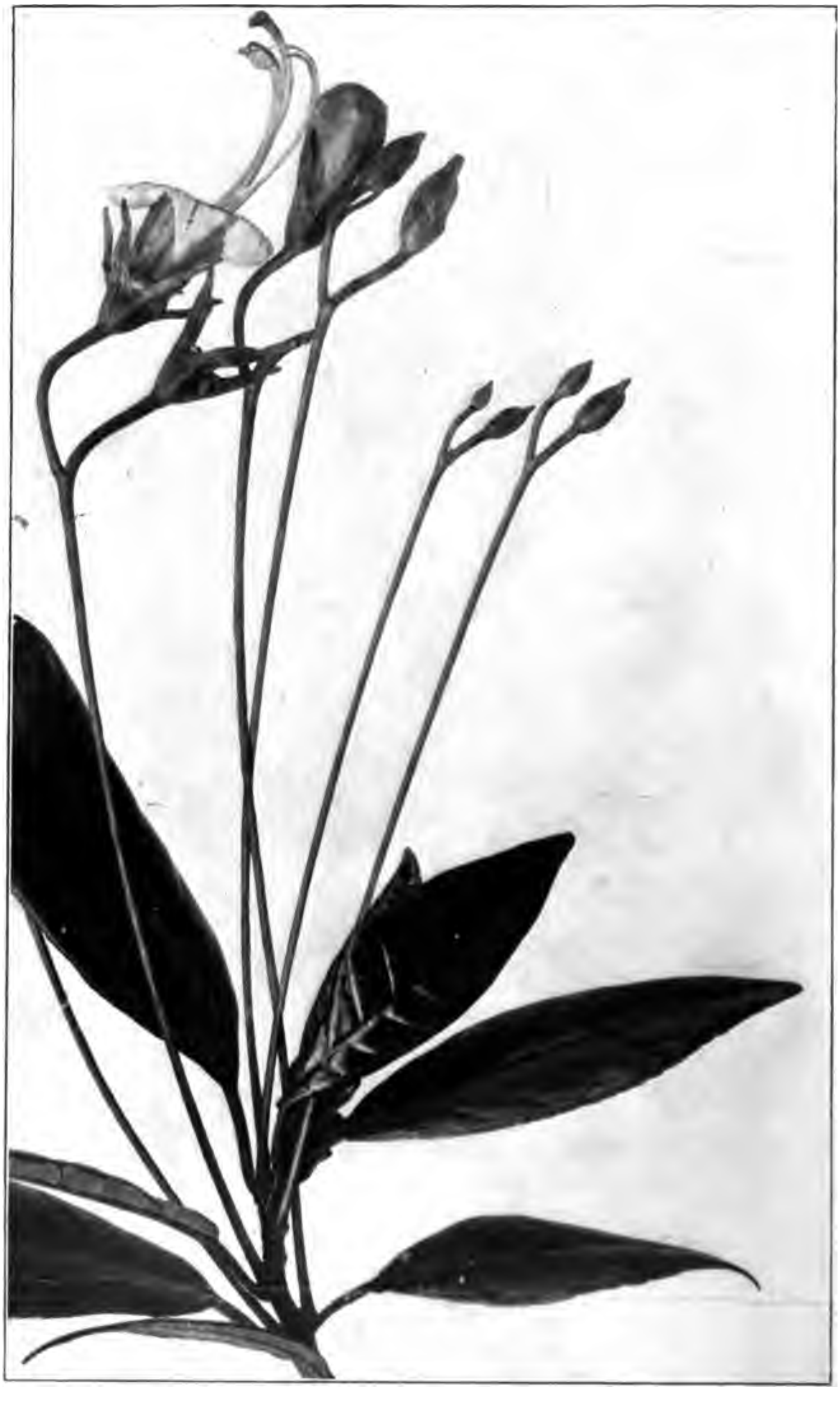
Péndula.

A tree from the eastern part of the island; height, 45 to 50 feet (13 to 15 meters); diameter 15 to 20 inches (37 to 50 centimeters). Wood, yellow, hard; specific gravity, 0.942; used for lumber. (Exp. 1857.)

A large tree, trunk rather short; wood very hard, making most excellent boards and posts. A very valuable wood with a specific gravity of 0.84. (Captain Hansard.)

Péndulo blanco. See *Vitex divaricata.*

Péndulo colorado. See *Citharexylum quadrangulare.*



PENTARHAPHIA ALBIFLORA.

Pentarhaphia albiflora. PLATE LI.

Family Gesneriaceae: this and *P. longiflora* seem to be very similar species; rather small shrubs growing in rocky places, and having the characteristic long-stalked asymetric flowers, greenish yellow, mottled with dark reddish stripes and spots.

Pentarhaphia longiflora. SPANISH TEA. See *Pentarhaphia albiflora.*

Pentarhaphia reticulata. CONRADIA.

An herb 8 to 12 centimeters high: found among rocks and in shady places. (Stahl, 6: 259.)

Peperomia.

A large genus of Piperaceae represented in Porto Rico by numerous species, mostly rather small and delicate herbs.

Peperomia portoricensis. YERBA DE GUAVA.

An indigenous herb from the mountain forests near Aybonito, Adjuntas, Utuado, and Maricao. (Urban, Symb. 1: 292.)

Pepinillo. See *Melothria fluminensis.*

Pepinito. See *Cucumis anguria.*

Pepino. See *Cucumis anguria.*

Pepino angolo. See *Sicana odorifera.*

Pepita amarga. See *Fevillea cordifolia.*

Pepper.

The red, Cayenne, Chile, or garden peppers belong to the genus Capsicum of the family Solanaceae, while the true black or white pepper is derived from species of Piper.

Peregil cimarron. See *Scrophularia micrantha.*

Perico cimarron.

This name was applied at Vega Baja to a species of Acalypha (No. 1035), still unidentified.

Periwinkle. See *Vinca rosea.*

Peronia. See *Abrus precatorius.*

Peronilas.

Bello gives this name for *Abrus precatorius*, but probably by error.

Persea carolinensis.

See note under "naguacatillo."

Persea gratissima. AGUACATE.

Variously known as "alligator-pear," "butter-pear," "avocate," "avocado," etc. Family Lauraceae. This well-known fruit of the Tropics has the external appearance of a large pear, but on being cut open is found to have a large central seed, which separates readily from the rather firm, somewhat buttery outer pulp, which is the part eaten. The "butter-pear," as it is sometimes called, is a salad fruit—if such a term may be used—being eaten with salt, vinegar, pepper, and other condiments. The pulp is scraped away from the outer hard skin with a spoon. Opinions differ greatly as to the value of this fruit; some are extremely fond of it, while others consider it quite insipid. Properly seasoned, it blends finely with dressings, and has recently been used as an ingredient of rich and elaborate salads. Treated with oil, salt, and tarragon vinegar, it has also been recommended cut in slices and served as a relish, or the "butter" mashed up with such a dressing may be applied to sandwiches. At present but a small quantity of this fruit is marketed in New York, but the demand is increasing and the prices are good, 20 cents apiece being an average figure, at which the business would certainly be very profitable. According to Semler, an oil extracted from the alligator pear is used in large quantities in America in soap manufacture, but the seat of the oil industry is not stated.

There are a great many varieties of the alligator pear, but the forms already in Porto Rico compare well with those of other countries. In view of the difficulties experienced in shipping this fruit, an effort should be made to secure some of the thick-skinned varieties of Central America. Selection, or the introduction of new varieties that will extend the season, will also greatly improve the chances of making their culture profitable.

One danger in relying on alligator pears as a source of income arises from the brittle nature of the wood, the branches being easily broken by strong winds, only occasional trees having been left uninjured by the storm of August, 1901. The tree is rather handsome, but never reaches very large size, old specimens being 35 to 40 feet (10 to 12 meters) high and a foot or 18 inches (30 to 45 centimeters) in diameter. There is a wild species in Cuba, *P. sylvestris*, there called "*aguacate silvestre*."

It furnishes a rather soft wood, with a specific gravity of 0.643. The grain is very fine. The texture is fibrous and rather brittle. The color is reddish brown, or sometimes light brown, with poorly-marked lines or undulations, more visible in the white parts, while the heart is mottled with light, irregular, curved spots of different colors, disposed almost symmetrically, and giving to the whole a most beautiful aspect. This wood, which is not used at all, is very brittle, but might, in our opinion, be employed in cabinet work. The bark is rather thick, very rough, irregular, ash-colored. (Grosourdy, **2**: 358.)

Petangueira. See *Eugenia portoricensis.*

Petitia domingensis. CAPÁ BLANCA.

Family Verbenaceae; a tree 10 meters high. The hard wood is good for fine work. Reported from Rancon and Utuado. (Stahl, **6**: 223.)

Petiveria alliacea.

Family Phytolaccaceae; a slender weed very common in waste places but prefering partial shade. It has a very disagreeable odor, strongly suggesting onions or garlic, and is said to injure the milk of cows, which seems entirely probable.

Phasemy. See *Phaseolus semierectus.*

Phaseolus adenanthus. HABICHUELA CIMARRONA.

Family Viciaceae; a woody, climbing annual in hedges and at the base of mountains. (Stahl, **3**: 76.)

Phaseolus lanceolatus. HABICHUELA CIMARRONA.

(Stahl, **3**: 78.)

Phaseolus lunatus. HABAS. LIMA BEAN.

A twining climber, both cultivated and escaped. (Stahl, **3**: 81.)

Phaseolus semierectus. PHASEMY. HABICHUELA PARADA.

An herbaceous, erect, branching annual 50 centimeters high, found in pastures. (Stahl, **3**: 77.)

In British Guiana experiments with this plant have seemed to warrant the belief that it will prove to be a tropical substitute for alfalfa.

Phaseolus vulgaris. BEAN. HABICHUELA.

Several varieties of the common bean are imported into Porto Rico, but the one most favored for local cultivation is a rather large, red variety. A bean collected near Ponce (No. 796) has the pods warted along both edges. It was called "haba," but is not the Lima bean to which that name is more often applied.

Phoebe cubensis.

Family Lauraceae; the form *antillana* is reported from Bayamon.

Phoenix dactylifera. DATE. DATIL.

The date palm has been introduced into Porto Rico, and while the trees reach a considerable size, particularly on the drier southern side of the island, it is not known that any fruit of good quality has been produced. Specimens of a date palm were obtained by Sintenis at Puerto Real near Cabo Rojo, and it is in that region that the tree might be expected to thrive best in Porto Rico, and the results of experiments which have been made would be of interest.

Although the date palm grows with apparent vigor in Porto Rico it is not likely that it will ripen fruit of marketable quality, as the climate is too cool and too moist. The date reaches perfection only in desert regions, and while it can stand slight frosts it must have exceedingly hot weather during the ripening season. That the tree will flourish is no indication that it will produce good fruit. In the Canary Islands an indigenous species of date palm is extensively grown for the sake of the leaves, which are made into baskets and serve other domestic purposes, but the fruit is nearly worthless, and genuine date palms which have been introduced do not succeed.

As yet dates are not known to have been successfully raised in America except in the desert regions of Arizona, California, and Mexico. In the latter country the date was introduced very early and was spread to Lower and Upper California by the Spanish missionaries. Although, according to Forbes's "California," dates and figs were exported from Lower California as early as 1837, the industry has not been greatly developed, owing, perhaps, to the fact that only seedlings were planted. Of late it has been found that the date succeeds well in the extremely dry and hot regions of Arizona, and cuttings of superior varieties have been imported in order that fruit of uniform, marketable quality may be secured.

Pholacilia diversifolia. See *Trichilia simplicifolia.*

Phoradendron chrysocarpum. PATA DE GALLINA.

A parasitic shrub of the family Loranthaceae. Bello gives the name "yerba capitana" for *Phoradendron berterianum*, which Urban refers to the present species. (Urban, Add. **4**: 357.)

Phoradendron dichotomum. YERBA CAPITANA.

A parasitic shrub said to have been found on *Mangifera indica* in Haiti, but known elsewhere only from native trees.

Phoradendron quadrangulare. YERBA CAPITANA.

Also called "quasimilla de Canario." A parasitic shrub related to the mistletoe. It attacks numerous species of native trees.

Phthirusa emarginata.

Family Lauraceae; reported from Aybonito.

Phthirusa parvifolia.

From Guanica.

Phthirusa portoricensis. See *Psychotria pendula.*

Phyllanthus grandifolius.

Family Euphorbiaceae; reported from Manati.

Phyllanthus nobilis antillanus.

From Fajardo and Aybonito.

Phyllocactus stenopetalus.

Family Cactaceae; cultivated in gardens at Penuelas. (Sintenis.)

Physalis angulata. SACABUCHE ANGULOSO.

Family Solanaceae; an herbaceous annual, 50 centimeters high, found in various parts of the island. The fruits are edible and in Jamaica are called winter cherries. The plant is one of the ground-cherry group. (Stahl, **6**: 122.)

Physalis linkiana.

An herbaceous annual or weed; from near Guanica.

Physalis pubescens. SACABUCHE PELUDO.

An herbaceous annual, 60 centimeters high, common. This is the common cultivated ground cherry or strawberry tomato. (Stahl, **6**: 121.)

At Arecibo the fruit of a species of Physalis was said to be used for stomach troubles, and the roots for toothache.

Physic nut. See *Jatropha curcas.*

Pica-pica. See *Mucuna pruriens* and *Fleurya aestuans.*

Picha de gato. See *Scolosanthus grandifolius.*

Pichana. See *Wissadula rostrata.*

Pichana mocha. See *Abutilon leiospermum.*

Pichana peduncular. See *Abutilon pedunculare.*

Picramnia pentandra. GUAREMA.

Family Simarubaceae; a shrub 10 to 15 feet (3 to 5 meters) high, from the vicinity of Cayey and Lares. The common name was recorded by Bello.

Picrasma excelsa. BITTERWOOD.

A small tree of the family Simarubaceae; found in Jamaica, Antigua, and several of the smaller islands. The bark and wood are extremely bitter and are now preferred to the genuine quassia from Guayana and Brazil. Picrasma is found in forests of low elevation near the sea.

Pictetia aristata. TACHUELO. PLATES LII, LIII.

Family Viciaceae; a tree 6 to 8 meters high. The wood is extremely hard and heavy. Found in the southeastern coastal regions. (Stahl, **3**: 50.)

Hill identifies "tachuelo" with "hachuelo," and with the calabash tree, Crescentia. Our informants, including Captain Lugovine and Señor Besosa, agree in giving the name to an extremely hard and heavy wood, which endures indefinitely in the ground and is used in supporting houses. The leaves have a spine from the midrib. A photograph of a branch was taken at Penon and a "habitusbild" of a clump of shrubby growth about 20 feet (6 meters) high in an open pasture at Coamo Springs.

Pictetia squamata.

A specimen from Coamo is in the National Herbarium.

Pigeon pea. See *Cajanus cajan.*

Pigeon wood.

A name applied in the British West Indies to several trees belonging to the genera Dipholis, Diospyros, and Coccolobis.

Pigweed. See *Amaranthus paniculatus* and *A. tristis.*

Pilea ciliaris.[a]

Family Urticaceae. This and *P. elegans*, broad-leaved species, are quite unlike *P. trianthemoidea.* Known from Adjuntas and Sabana Grande.

Pilea trianthemoidea. ARTILLERY PLANT. VERDOLAGUILLO.

A very fine-leaved, fern-like plant, common in most rocky situations where the ground is moist; also on roofs of houses in mountain districts. The stone water filters and storage jars for water are often overgrown with this species.

Pilocarpus racemosus.

An indigenous shrub or small tree, 2 to 5 meters high, belonging to the Rutaceae. Reported from Aguado, Aguadilla, and near Rio Grande.

Pimenta acris. See *Amomis caryophyllata.*

Pimenta officinalis. See *Pimenta pimenta.*

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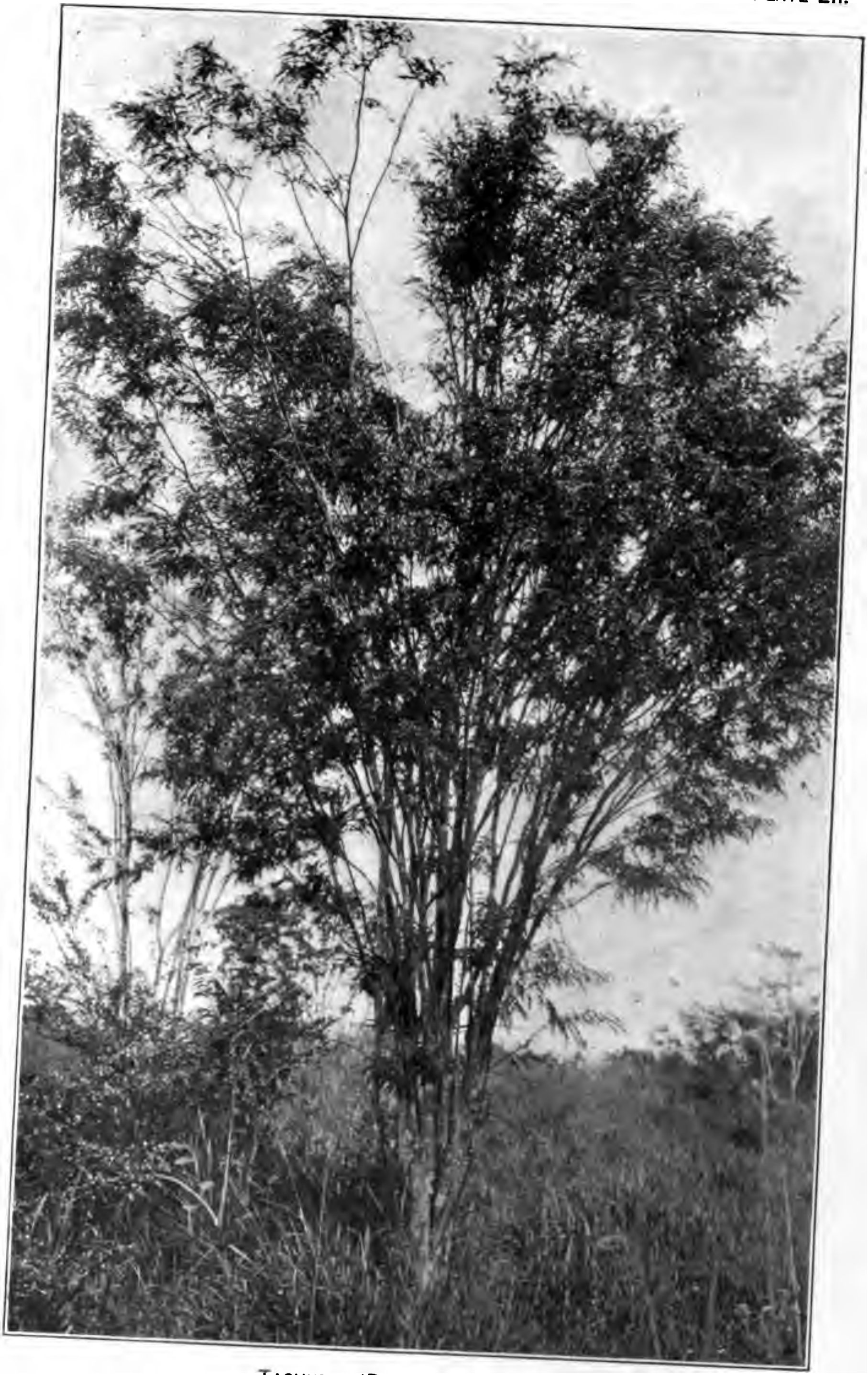
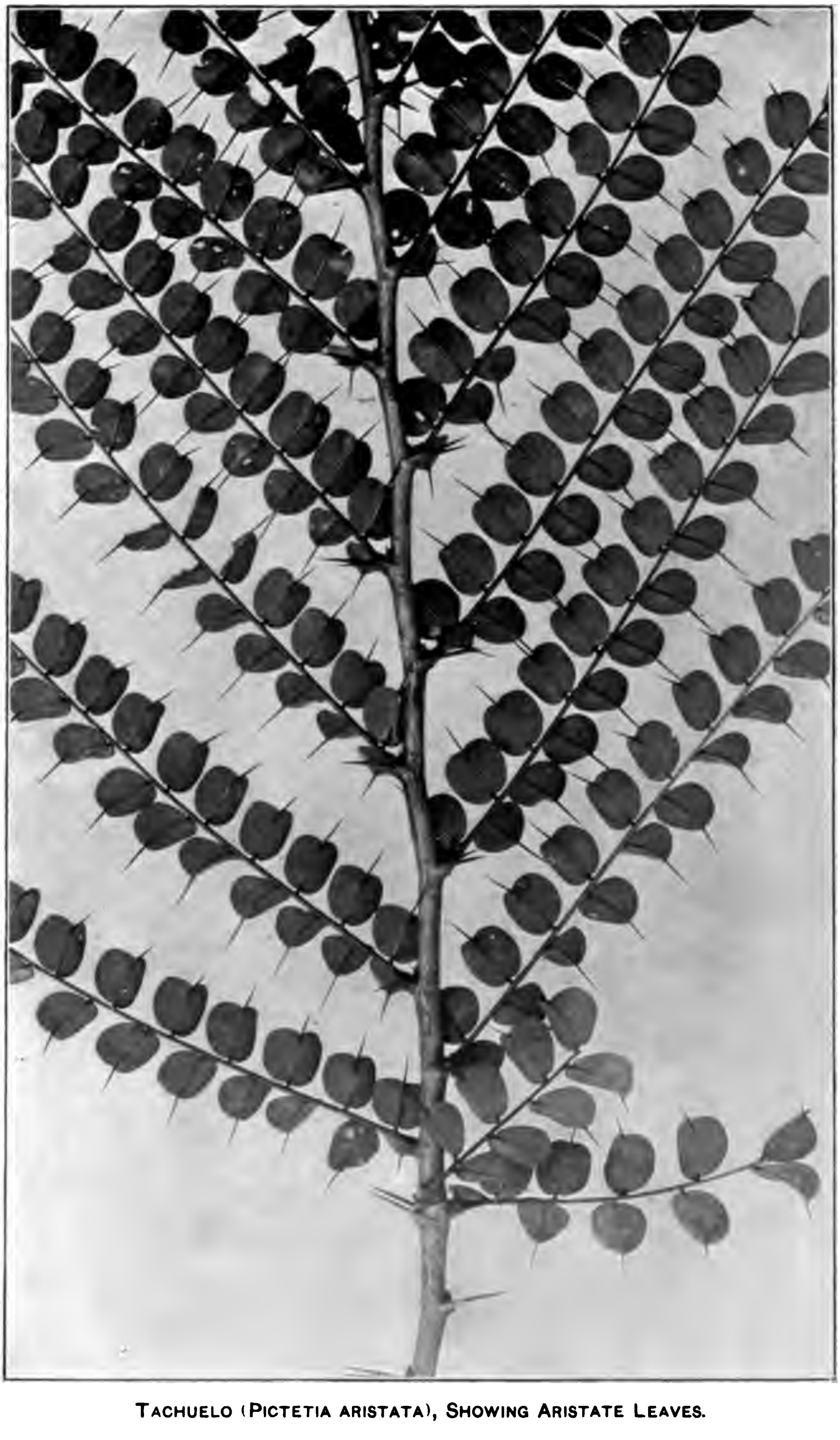
[a] The name Adicea Raf. antedates Pilea Lindl., but the species here referred to have not been transferred to that genus.



TACHUELO (PICTETIA ARISTATA).



TACHUELO (PICTETIA ARISTATA), SHOWING ARISTATE LEAVES.

Pimenta pimenta. ALLSPICE.

In Urban's revision of the Myrtaceae (Add. 2: 89) this species is not reported from Porto Rico, but the Porto Rican references of Stahl and other writers are applied to *Amomis caryophyllata.*

A tree belonging to the Myrtaceae and formerly placed in the genus Eugenia. Mr. Hill reports it as abundant on the south side of Porto Rico, in the region between Guayama, Coamo, and Ponce; but the species is not, in fact, known to occur in Porto Rico where the names "pimienta" and "pimienta malagueta" are applied to the bay-rum tree, *Amomis caryophyllata.* The allspice tree has been found in Cuba and Jamaica, also in Mexico and Central America, but not, as far as known, anywhere else in the West Indies. The allspice of commerce consists of the unripe fruits, which must be dried quickly before the flavor has time to deteriorate. Large quantities are shipped to Europe and the United States from Jamaica, where the tree is cultivated, or allowed to spread itself over waste lands or pastures. Hill explains the fact that no allspice has been exported from Porto Rico by saying that the fruits are allowed to drop from the trees and are not properly cured.

Pimenta vulgaris. See *Amomis caryophyllata.*

Pimento. See *Pimenta pimenta.*

Pimienjo.

Captain Hansard gives the specific gravity of this wood as 1.31.

Pimienta.

This name, which properly means "pepper," has been applied to *Amomis caryophyllata*, also in the combination "pimienta malagueta." In Cuba and Jamaica, where the true allspice tree (*Pimenta pimenta*) grows, the same names are used for it.

Pimienta malagueta. See *Amomis caryophyllata.*

Pimiento. See *Capsicum annuum* and *Amomis caryophyllata.*

Pina.

Enumerated by Hill among "forest trees yielding fruits." There is nothing to indicate the identity of the plant alluded to.

Pindar. See *Arachis hypogea.*

Pineapple. See *Ananassa ananas.*

Pino.

A tree from the interior of the island; height, 45 to 50 feet (13 to 15 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood white, very hard; specific gravity, 0.960; used in boat building. Also called "cipil." (Exp. 1857.)

Pinon espinoso. See *Erythrina corallodendron.*

Piñuela.

A name applied to numerous wild plants having a real or fancied resemblance to the pineapple. The numerous wild species of Tillandsia and other bromeliaceous plants are called "piñuelas," as are also orchids, both terrestrial and epiphytic. One of the latter, with large fleshy bulbs, furnishes a strong glue or varnish-like cement, used particularly for joining the rudely manufactured domestic guitars. It is quite rare, and each bulb is said to be valued at 25 centavos.

Pinzona calineoides.

Family Dilleniaceae. A climbing vine from Utuado.

Piper aduncum.

A species agreeing with other West-Indian material in the National Herbarium which was collected near Toa Baja (No. 259). The leaves are minutely but distinctly scabrous on both sides. A shrub 8 feet (2.5 meters) high.

Piper citrifolium. HIGUILLO AMARGO.

Collected at Atola Teja, between Bayamon and Toa Baja (No. 240). Very similar in general appearance to the form identified as *P. aduncum*, but agreeing with the present species in having the leaves smooth on both sides.

Piper macrophyllum.

Family Piperaceae; a shrub 12 to 20 feet (4 to 6 meters) high on rocky hills; known from Adjuntas. (Grisebach.)

Piper marginatum.

Known from Aguadilla.

Piper peltatum. See *Heckeria peltata.*

Piper umbellatum. See *Heckeria umbellata.*

Piptadenia peregrina. COJOBANA.

Also known as Cojobilla. Family Mimosaceae; a tree 5 meters high; older growth covered with spines; found at Bayamon. (Stahl, 3: 144–152.) See note under *Acacia angustiloba.*

Piptocarpha triflora.

A composite shrub, known from Sierra de las Piedras.

Piquete. See *Bidens leucantha* and *Cosmos caudatus.*

Piriqueta cistoides. See *Piriqueta villosa.*

Piriqueta ovala. See *Piriqueta ovata.*

Piriqueta ovata. PIRIQUETA OVALA.

Family Turneraceae. (Stahl, 4: 159.)

Piriqueta villosa. PIRIQUETA.

An herbaceous erect annual, 40 to 50 centimeters high, in dry sandy soil. (Stahl, 4: 157.)

Pisonia aculeata. ESCAMBRON.

Also called "uña de gato," or "cat's claw." A spiny shrub belonging to the family Nyctaginaceae; reported from near Manati.

Pisonia obtusata. MAJAGUA QUEMONA.

Also called "palo de corcho." An indigenous shrub.

Pisonia subcordata. PALO BOBO.

An indigenous tree reaching a height of 20 meters. According to Urban two forms, *albida* and *gigantophylla*, have been found in Porto Rico; reported from Barranquitas. (Urban, Add. 3: 318.)

Pistia stratiotes. WATER-LETTUCE.

Family Araceae; a floating, stemless, stoloniferous herb, known from near Manati.

Pitajaya. See *Cereus triangularis.*

Pitangueira. See *Eugenia biflora.*

Pithecolobium filicifolium. COJOBANA.

Family Mimosaceae; a forest tree 10 meters high; leaves finely divided; spineless. (Stahl, 3: 137.)

Pithecolobium saman. SAMAN.

Some writers state that the name "algarrobo" is applied to this species. A large, spreading tree, 15 to 20 meters high, planted for shade in yards and public grounds. The trunk is inclined to be short and thick, while the branches are horizontal and extremely long. According to Stahl the wood is not very hard, with the heart of a handsome red color. On account of its lack of durability it is very little used. The flowers appear in spring and summer, and all the growing parts are slightly hairy. (Stahl, 3: 154.)

This tree is sparingly introduced into Porto Rico, but if the accounts of it are correct it is worthy of much more general planting, as advised in Trinidad by Professor Hart in connection with the following report:

"Probably there are few tropical trees which are so useful for a variety of purposes as the saman or zaman of Central America. In Jamaica this tree is known as the 'guango;' in Trinidad, by its Spanish name of 'zaman,' or its corruption 'saman.' The tree is a native of Central America, from Nicaragua southward to Brazil. It is a large, umbrageous tree, belonging to the order Leguminosae, or the Pea family, many of which are noted for their property of accumulating or storing nitrogen in the soil. In Jamaica it is well known, and grown for shading 'Guinea' grass fields. In Trinidad it has not the same good reputation for shade purposes, as its place is in a manner usurped by the quicker growing 'bois immortel.'

There is some reason, however, to doubt the superiority of the latter over the former, and personally I am inclined to the belief that the claims of the 'saman' are much higher from every standpoint. The tree can be seen in the botanic gardens, shading nutmegs, cacao, coffee, tea, and other products to the greatest advantage; it is, besides, a tree much less liable to fall and injure the plantation than the bois immortel, and being of the same family it possesses the power of becoming a real 'madre de cacao,' just as well as the bois immortel or Erythrina. For 'Guinea grass' pastures the tree gives a fine shade, and it is also an excellent one for planting in ordinary 'low-bite' pasture, both for the benefit of herbage and also as a shade for the cattle.

"In Nicaragua the wood of this tree is used to make wheels for ox carts, solid sections being sawn through the trunk for the purpose. It gives a splendid dark-colored wood with excellent grain, which takes a fine polish. The legumes, or beans, as they fall from the tree, are greedily eaten by cows and horses, although they are apt to give internal troubles of a minor character to the latter. Professor Harrison, of Demerara, who analyzed the pods, observed that the beans have about the same average composition as carob beans, obtained from *Ceratonia siliqua*, but as the seeds of the saman invariably pass through the stomach of a cow without being digested, the food value of the seed must be eliminated to obtain the true value of the legume as a cattle food. I understand that Professor Harrison, who published the original analysis, will shortly complete it by a separate examination of the seed. Whatever may be the result, it is certain that the pods or beans are a very suitable food for milch cows, as shown by the character of the milk afforded by animals fed regularly upon them. In some places *Pithecolobium saman* has obtained the name of 'rain tree,' for what reason it is not clearly apparent; but it is certain that much larger crops of 'Guinea grass' can be grown under its shade than in the open. It is one of those trees in which, like some of the Mimosas, the leaflets are possessed of the power of movement, and close together at sundown, thus allowing the dew to fall upon the crops beneath; while, when the sun is high, the foliage is spread out in a form which securely screens off its rays and protects the ground beneath from excessive evaporation. In the gardens we have large examples of these trees, planted it is supposed between the years 1818 and 1824, so that they are over 70 years of age, and are probably the finest in the West Indies. The spread of the branches of several of them reaches a diameter of considerably over 140 feet (42 meters). For all purposes of shade, so necessary in a moist tropical climate, the saman is certainly an excellent tree, and it grows at a rate which should satisfy any but the most impatient. A tree with a trunk of 12 inches (30 centimeters) diameter can be grown in good soil in about ten years, and large enough to shade cacao and other shrubby trees in from four to five years.

"In islands subject to cyclonic storms the tree suffers considerably, owing to the great weight and size of its branches, but in Trinidad our trees have never suffered in this way, as we are fortunately outside the common cyclone or hurricane area."

Pithecolobium unguis-cati. Uña de gato. Black bead.

A shrub 10 feet (3 meters) high, from the south coast. (Stahl, 3: 139.)

Near Guayanilla this plant was called "escambron colorado."

Plantago major. Llanten.

Family Plantaginaceae. A gigantic specimen was collected at Adjuntas by Sintenis. The common name is given by Bello.

Plantain. See *Musa paradisiaca.*

Plantain, Wild. See *Heliconia.*

Plantanilla blanca. See *Asclepias nivea.*

Platanillo. See *Asclepias curassavica.*

Platanillo blanco. See *Asclepias nivea.*

Plátano. See *Musa.*

Pluchea odorata. Salvia.

A composite shrub, 3 to 4 meters high, having a peculiar odor: found in all parts of the island, and used as a mild stimulant. (Stahl, 5: 122.)

Plum. See *Spondias lutea.*

Plumbago capensis.

An ornamental shrub cultivated in gardens at Yabucoa. (Sintenis.)

Plumbago scandens. Higuillo.

Family Plumbaginaceae; a shrubby trailer. The root is sometimes used as a blistering agent. Our plants are from Coamo Springs, where the above common name is in use. Bello calls this species "meladillo."

Plumeria alba. Tabaiba.

Family Apocynaceae; a shrub 3 to 4 meters high, having a milky juice. Found along the coast. Bello records the common name "alelí cimarron." (Stahl, 6: 74.)

A wild tree 30 to 35 feet (9 to 11 meters) high, with a rather straight trunk 6 to 8 inches (15 to 20 centimeters) in diameter. The wood is considered very good for certain classes of carpenter work that need both flexibility and resistance. It is yellowish white or light grayish yellow in color, marked with unequal undulations, giving the wood a rather attractive appearance. The texture is fibrous and compact and the grain fine. (Grosourdy, 2: 395.)

Plumeria krugii. Tabeiba.

A recently described species known only from Maricao. (Urban, Symb. 1: 387.)

Plumeria obtusa. Alelí cimarron.

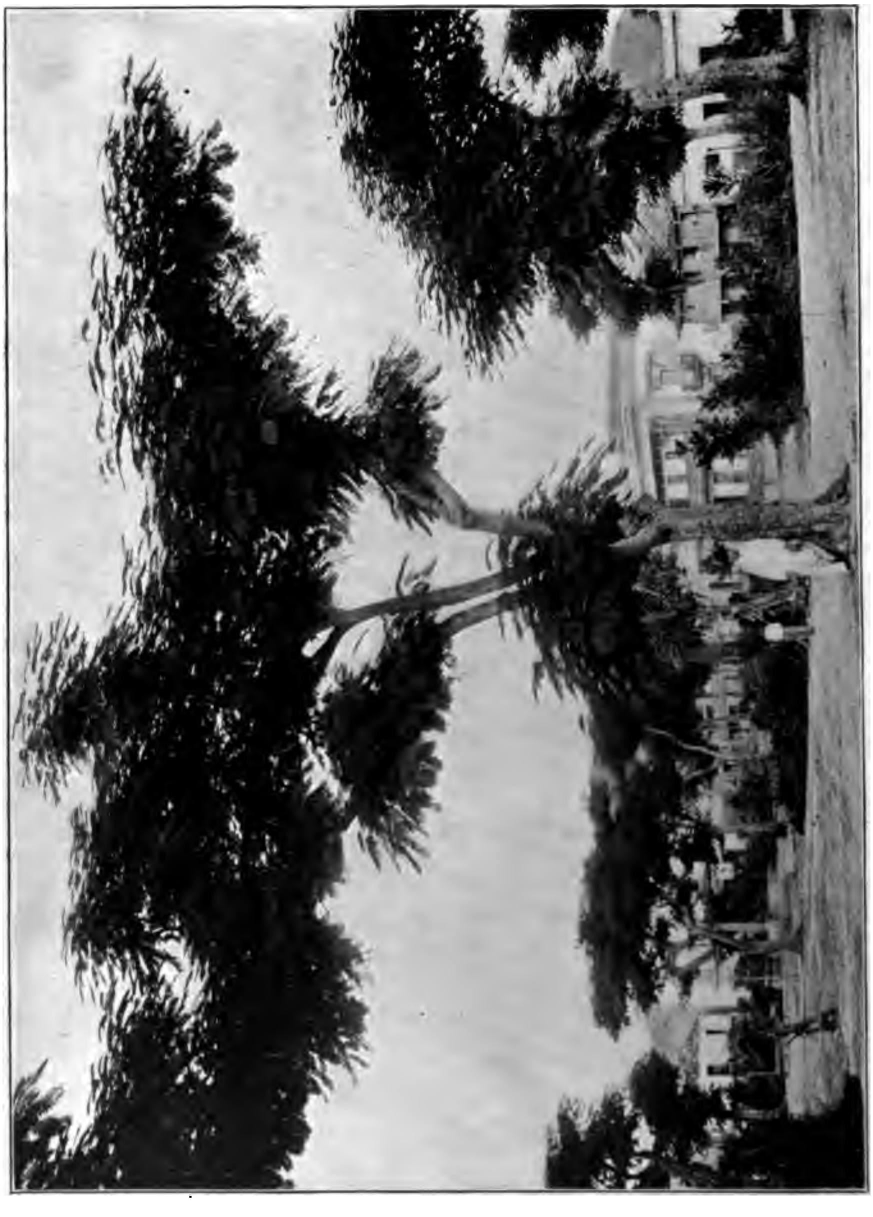
A tree or shrub. (Stahl, 6: 76.)

Plumeria portoricensis. Alelí cimarron.

Also called "tabeiba;" a species recently described from a drawing by Krug, probably in the vicinity of Mayaguez. Said to be *Plumeria obtusata* of Bello. (Urban, Symb. 1: 387.)

Plumeria rubra. Frangipani. Alelí.

A shrub or small tree, 4 to 5 meters high, having a milky juice. Cultivated in gardens on account of the extremely fragrant flowers, and sometimes called the West Indian red jasmine. The name "frangipani" or "frangipanni" is supposed to have been applied to this and other species of Plumeria on account of the resemblance to that of a perfume compounded in the middle ages from a large number of ingredients by an Italian nobleman of that name. It is not known that any attempt has been made to extract a perfume from the flowers of Plumeria.



Flame Tree (Poinciana regia). In the Plaza, Caguas.

Plumeria tenorii. ALELÍ AMARILLO.

A shrub, 4 to 5 meters high, cultivated in gardens. (Stahl, **6:** 76.)

Poaya. See *Spermacoce portoricensis.*

Podocarpus coriaceus.

Family Taxaceae; a broad-leaved coniferous tree, known from near Maricao. Other species of Podocarpus are known from Jamaica and other West Indies; also from South America. The genus also extends through the Pacific islands to the Malay region, China, and Japan.

Poinciana pulcherrima. CLAVELLINA.

A leguminous shrub of 12 feet (4 meters), widely cultivated in gardens as an ornamental. This species was observed at Juana Diaz. (Stahl, **3:** 123.)

The trunk of this tree reaches 3 to 4 inches (7 to 10 centimeters) in diameter. It is said that its wood is very beautiful, and it is perhaps susceptible of being utilized for fine carpentry work. Its color is a striped orange. It is rather soft and is of a rather fine grain and texture. Specific gravity, 0.389. (Grosourdy, **2:** 385.)

Poinciana regia. FLAME TREE. FLAMBOYAN. PLATE LIV.

This most beautiful caesalpiniaceous tree is a native of Madagascar, but it is now planted as an ornamental throughout the tropics. (Stahl, **3:** 124.)

The large, finely divided leaves appear almost as delicate as maiden-hair fern fronds, and the spreading habit renders it an excellent shade tree, in addition to the ornamental value of the extremely showy flowers. The wood is, however, not strong, and many of the trees in Porto Rico had evidently suffered severely. The plate shows the plaza at Caguaz which is planted exclusively in Poinciana with excellent effect. Grosourdy (**2:** 385) gives the specific gravity of 0.828.

Poligala larga. See *Polygala longicaulis.*

Polisandro. See *Stahlia maritima.*

Polygala longicaulis. POLIGALA LARGA.

Family Polygalaceae; an herbaceous, erect annual, 30 to 40 centimeters high. In sandy places. (Stahl, **2:** 52.)

Polygala paniculata. OROSNE.

An herbaceous annual found in pastures, 20 to 25 centimeters high; reported from Mayaguez. The common name was heard in the barrio Atola Teja between Bayamon and Toa Baja. (Stahl, **2:** 51.)

Polygala variabilis. POLIGALA VARIABLE.

A slender annual in savannas. (Stahl, **2:** 54.)

Polygonum acre. SMARTWEED. YERBA DE HICOTEA.

Family Polygonaceae: a widely distributed species of smartweed.

Polypodium polypodioides. COLADILLA.

A small fern. Rolls of the dried fronds are sold in the market at Ponce as a remedy for diseases of the blood.

Pomarosa. See *Jambosa jambos.*

Pomegranate. See *Punica granatum.*

Pomelo. See *Citrus decumana.*

Pomorosa. See *Jambosa jambos.*

Pongatium indicum. See *Sphenocles zelanica.*

Popon. See *Ibatia maritima.*

Porophyllum ellipticum. YERBA POROSA.

An herbaceous, annual composite, 50 centimeters high; grows along roadsides and in dry, stony pastures. (Stahl, **5:** 146.)

Porophyllum macrocephalum. YERBA DE PEO.

Also called "yerba de cabra." An annual herb, said to have the odor of Bifora.

Urban describes a new variety, *ciocarpum*, from the south side of the island. *Porophyllum ellipticum genuinum* is also reported from numerous localities, and is identified with *P. ruderale* of Grisebach and Stahl, while the original *Kleinia ruderalis* of Jacquin is placed under a new variety, *ruderale* of Urban.

Porophyllum ruderale. See *Porophyllum ellipticum.*

Portulaca oleracea. VERDOLAGA.

The common purslane.

Potamogeton pauciflorus.

A very delicate, narrow-leaved species. Known from a river near Yauco. A coarser, undetermined species was collected by Sintenis in Lake Tortugero, near Manati.

Potato. See *Solanum tuberosum.*

Pothomorphe peltata. See *Heckeria peltata.*

Pothomorphe umbellata. See *Heckeria umbellata.*

Prickly pear. See *Opuntia.*

Primrose willow. See *Jussiaea repens.*

Pringamoza. See *Tragia volubilis.*

Priva echinata. PRIVA ERIZADA.

Family Verbenaceae; a slender, herbaceous annual, 50 centimeters high, growng in stony places. (Stahl, **6**: 204.)

Priva erizada. See *Priva echinata.*

Prosopis juliflora. MESQUIT.

This leguminous species is reported by Grisebach as being abundant in dry situations in Jamaica, where the name "cashaw" is applied to it.

Proustia krugiana.

A climbing composite, 1 to 4 meters long, known from Coamo and Yauco. (Urban, Symb. **1**: 471.)

Prunus occidentalis. ALMENDRILLO.

Family Rosaceae; a large tree, 15 meters high. The hard wood is used in making furniture. Flower and leaves have an odor of bitter almonds. Bello calls this tree "almendron." (Stahl, **4**: 68.)

A wild tree, about 45 feet (13 meters) high, with a straight, rather long trunk 15 to 18 inches (37 to 45 centimeters) in diameter, furnishing a much-valued wood, strong and elastic. This wood is of ordinary weight and is almost the color of light mahogany, and very similar to the cherry of Europe. Specific gravity, 0.846. The wood is used in the country for the framework of houses, but it appears to us that it might be employed, like the cherry of Europe, for cabinetwork and the interior of houses. (Grosourdy, **2**: 361.)

Pseudolmedia spuria.

Family Moraceae: a high tree, known from Naguabo.

Psidiastrum dubium.

A myrtaceous shrub, described from the western coast of the island by Bello.

Psidium guajava. GUAVA. GUAYAVA.

Also called "guayaba;" a bush or small tree of the family Myrtaceae, which bears the well-known edible fruit called "guava" in English, and "guayava" in Spanish.

The guava is perhaps the only fruit now existing on the island in quantities sufficiently large to make possible the early establishment of an industry based upon it. In some districts neglected land is covered for considerable distances with guava bushes, and there seems to be no reason why the manufacture of the justly celebrated guava jelly should not be undertaken on a considerable scale.

On inquiring why something of this kind had not already been done I was informed that it was owing to the high price of sugar. Formerly there was a *consumo* or consumption tax of 4 cents a pound on white sugar, which, of course, prevented its use for manufacturing purposes. With the removal of this, and the adjustment of other trade disturbances, there ought to be no difficulty in gradually building up a considerable industry in guava jelly, the demand for which has probably been limited only by the fancy prices at which it has always been held.

Guava bushes are growing wild in great quantities in all parts of the island. The amount of fruit available for manufacture of jelly must be very large.

Described as a tree 15 to 20 feet (4 to 6 meters) high, with a trunk 6 inches (15 centimeters) in diameter. It furnishes a wood of a fine, compact texture. The color is brownish gray and red, sometimes with lighter, parallel, or undulous lines, which give the wood a mottled and very handsome appearance. It is much appreciated in carpenter work that is suited to its small size and where strength and elasticity are needed. It serves thus for agricultural implements and in farm structures. Specific gravity, 0.696. (Grosourdy, **2**: 388.)

Psidium guineense.

A species of guava cultivated in Santo Domingo, Jamaica, Guadaloupe, and Martinique, which, notwithstanding the specific name, which would indicate an African origin, is now believed to be indigenous in Trinidad and on the South American continent. It is said to have the taste of strawberries. (Urban, Add. **2**: 85.)

Psidium pomiferum. See *Psidium guajava.*

Psychotria. PALO MORO.

The name "palo moro" is applied to numerous species of this extensive genus of rubiaceous shrubs, in particular to *P. brachiata*, *P. grandis*, *P. nutans*, *P. pedunculata*, *P. pseudo-pavetta*, and *P. undata*. (Stahl, **5** : 68–75.)

Psychotria brachiata.

A shrub 6 to 8 feet (1.5 to 2.5 meters) high; reported from Tabucoa and Guayabota.

Psychotria horizontalis.

A shrub 3 to 4 feet (about 1 meter) high; from Maunabo.

Psychotria maleolens.

A shrub or tree sometimes attaining a height of 10 meters and giving off an unpleasant aromatic odor. From El Yunque and forests in the vicinity. (Urban, Symb. **1**: 444.)

Psychotria maricaensis.

A new species, probably a shrub, from Maricas. (Urban. **1**: 448.)

Psychotria myrtiphyllum.

A fragrant shrub, 1 to 3 feet (30 to 90 centimeters) high; known from Sierra de las Piedras.

Psychotria patens.

A shrub from Sierra de Juncos.

Psychotria pendula.

An epiphytic species taking root in the mountain forests. Several eminent botanists have mistaken it for one of the Loranthaceae, or mistletoe, family. Urban names six subspecies, only one of which, *P. pendula grosourdyana*, is credited to Porto Rico. This is a small plant with the flowers white and the petioles and calyx blood red. There seems to be no reason why the specific part of De Candolle's original name *Loranthus portoricensis* should not be applied to this peculiar plant, and that it should also have specific rank seems extremely probable from the descriptions, distribution, and synonym given by Urban. Referred by Eichler to Phthirusa and by Baillon to Uragoga. (Urban, Symb. **1**: 445.)

Psychotria platyphylla.

A new variety *angustior* is described from mountain stations near Adjuntas; found also as Utuado. (Urban, Symb. 1: 449.)

Psychotria pubescens.

A shrub 10 to 12 feet (3 to 4 meters) high, in mountain woods. Peñuelas, on Mount Llano.

Psychotria sintenisii.

A shrub from the vicinity of Cobo Rojo. (Urban, Symb. 1: 448.)

Psychotria undata. BALSAMO.

A specimen supposed to represent this species was obtained at Vega Baja (No. 1019) under the name "balsamo."

Pterocarpus draco. PALO DE POLLO.

Family Viciaceae; a tree 20 meters high, found along swampy coasts. Wood soft. (Stahl, 3: 93.)

Grosourdy contracts the native name to "palo pollo," and describes it as a wild tree, 40 feet (12 meters) high, with a trunk 14 to 18 inches (35 to 40 centimeters) in diameter, furnishing a wood dirty-white in color that breaks with a horizontal fracture. In San Juan fire screens are constructed of this wood. Also used as fuel. Specific gravity, 0.554. Of dry wood from the roots, 0.138. (Grosourdy, 2: 407.)

Pterocaulon virgatum. ESCOBILLON.

An herbaceous, erect annual, composite, 50 centimeters high, growing in sandy pastures. (Stahl, 5: 124.)

Punica granatum. POMEGRANATE. GRANADA.

The pomegranate is a fruit adapted to dry climates, such as those of North Africa, Arabia, and Persia. The north side of Porto Rico is probably too moist, but in the dry southwestern corner of the island more favorable conditions may be found, although extensive planting is not likely to be found advisable. The bush resembles slightly the Japan quince, and has showy red flowers. Little fruit was seen, and that was small and inferior. Southern California and Arizona can probably produce the pomegranate to much better advantage than Porto Rico, but there is little demand for it in the general market, and no indication that it will become popular outside the dry climates where other more satisfactory fruits are scarce.

Propagation from cuttings is easy, and in South Africa excellent pomegranate hedges are said to be frequent. The bark and the rind of the fruit contain a yellow dye used for leather in Morocco.

In the market of Ponce it was claimed that there were two forms, "blanco" and "colorado," but the difference was very slight.

Pursaetha.

In Engler and Prantl's *Natürlichen-Pflanzenfamilien* the genus Entada is treated as a synonym of Pursaetha.

Quamoclit coccinea. CAMBUTERA.

An annual, cultivated in gardens. (Stahl, 6: 165.)

Quamoclit quamoclit. CYPRESS VINE. CAMBUTERA.

A climbing herbaceous annual, cultivated in gardens. It has a variety of names in Jamaica, viz, Indian creeper, Indian pink, red bell flower, Barbadoes sweet william. Bello writes the common name "cambustera." (Stahl, 6: 164.)

Quararibea turbinata. GARRACHO.

Family Bombacaceae; a wild tree 5 meters high, common in all parts of the island. Bello records the name "palo de garrocha" for *Myrodia turbinata*. (Stahl, 2: 101.)

"A wild tree produced in abundance in all parts of the island, 25 to 30 feet (7 to 9 meters) high, the trunk 6 to 8 inches (15 to 20 centimeters) in diameter. The wood is rather light and soft, ash-colored. Has no use." (Grosourdy, **2**: 384.)

Quasimilla de canario. See *Phoradendron quadrangulare.*

Quassia amara.

A small tree of the family Simarubaceae, native in Guayana and Brazil, but now generally cultivated in the tropics of both hemispheres. It furnishes the bitter quassia wood, and its medicinal extract is valued as a tonic, particularly for the digestive system.

Quebra hacha. See *Ardisia purpurascens.*

Quebra hachas. See *Thouinia tomentosa.*

Quebracho.

This name is applied by Engler and Prantl to Thouinia, a genus noted for its hard wood and represented in Porto Rico by several species. The "quebracho" bark imported for tanning purposes is from the Argentine Republic and the valley of the La Plata and is obtained from *Schinopsis lorentzii*, a tree of the family Anacardiaceae. "Quebracho" is a contraction of "quebra hacha" and has the same meaning, "break-axe" or "axe-breaker" in allusion to the extreme hardness.

Quenepa. See *Melicocca bijuga.*

Quiebra hacha. See *Eugenia pseudopsidium portoricensis, Thouinia portoricensis, T. striata*, and *T. tomentosa;* also *Schmidelia occidentalis.*

Quiebra hachas. See *Allophylus occidentalis.*

Quina. See *Exostemma floribundum* and *Antirrhoea coriacea.*

A tree from the northeastern part of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 10 to 12 inches (25 to 30 centimeters). Wood, pinkish yellow, rather soft; specific gravity, 0.798; used in cabinet making. Also called "boje." (Exp. 1857.)

Believed to be the genuine "cinchona" supposedly introduced. Found about Manati; specific gravity of wood 0.87. (Captain Hansard.)

Quina del pasto. See *Leonotis nepetaefolia.*

Quinine. See *Cinchona.*

Quisqualis indica.

Family Combretaceae; cultivated about dwellings near Maunabo.

Quitaran. See *Colubrina ferruginosa.*

Rabajunco. See *Casearia stipularis.*

According to Captain Hansard this wood has a specific gravity of 1.07, is very pliable, and is used in hut building. Probably another spelling of "rabojunco."

Rabo de raton.

A name meaning "rat-tail" applied to *Gonzalea spicata*, a rubiaceous shrub, and to a species of Chaetochloa.

Rabojunco. See *Casearia stipularis.*

A wild tree 30 feet (9 meters) high with a trunk 12 to 14 inches (30 to 35 centimeters) in diameter. Furnishes a white, flexible wood used in the roofing of rude houses. (Grosourdy, **2**: 411.)

Rabo puedo.

A tree from all parts of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 9 to 10 inches (22 to 25 centimeters). Wood, white, soft; specific gravity, 0.725; used in building houses. (Exp. 1857.)

Radish. See *Raphanus sativus.*

Rajania cordata.

Family Dioscoreaceae; called in Cuba "alambrillo." The variety *scorpioidea* has been found in the vicinity of Maunabo.

Rama menuda. See *Myrcia splendens.*

Ramon.

On sale by an herb dealer in the market of Ponce; consists of the bark of a tree of the same name; a decoction with water is taken by women to assist in stopping lactation.

Ramonillo.

A tree from the interior of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 15 to 18 inches (37 to 45 centimeters). Wood, white, hard; specific gravity, 0.956; used in building houses. (Exp. 1857.) (Grosourdy, 2: 412.)

Ramoncillo.

A wood with a specific gravity of 0.89. (Captain Hansard.)

Randia aculeata. INK BERRY. TANTILLO.

Family Rubiaceae; a shrub or small tree, widely distributed in the West Indies. It yields a blue dye, and the wood is used for minor purposes when toughness is required. Bello calls this species "cambron." (Stahl, 5: 38.)

Randia formosa.

From near Jayuya, where it is cultivated about buildings.

Randia sagraeana.

A species with fruits warted and much larger than those of *aculeata;* the spines are also three-pointed. Collected at Guanica. (Sintenis.)

Raphanus sativus. RADISH.

Although of temperate origin and selection, the radish is one of the vegetables which does fairly well in the Tropics, its extremely quick growth offering little time for the deterioration suffered by many plants of larger and longer growth. Of course it is improbable that the quality could be maintained from the seed, if any could be ripened, but with good imported stock the radish is one of the temperate vegetables which it may be worth while to plant.

Rasca garganta. See *Parathesis crenulata.*

Raton. See *Matayba domingensis.*

Rattlewort. See *Crotalaria.*

Rauwolfia nitida. PALO DE MUÑECA.

Family Apocynaceae; a tree 3 to 5 meters high, found along the coast and in sandy places; flowers nearly all the year. Found in the Greater Antilles and in some of the Lesser Antilles. Reported from Guanica. (Stahl, 6: 69.)

Ravenala.

The so-called travelers' tree, travelers' palm, or travelers' fountain, is one of the conspicuous tropical ornamentals which one misses in Porto Rico. It is a near relative of the banana, and resembles that plant especially in the leaves; these are, however, two-ranked, so that the whole tree has the form of a gigantic fan. The sheathing bases of the leaves, instead of infolding each other to make a cylindrical bundle like the "trunk" of the banana tree, are borne on a genuine trunk one above another, and are fitted so close together as to hinder evaporation of the water, which runs down the channel on the upper side of the midrib. By perforating the sheath near the base one may draw out quite a quantity of water, but this is liable to contain dirt and larval insects. The oily edible arillus covering the seeds is bright blue.

Ravenia urbani. TORTUGO PRIETO.

Said to be a very beautiful tree, 10 to 15 meters in height; indigenous, but very rare, occurring only in the higher forest region of Mount Jimines, in the Sierra de Luquillo. It is a member of the family Rutaceae, to which the orange belongs. (Urban, Add. 3: 240.)

Red bellflower. See *Quamoclit quamoclit.*

Red sorrel. See *Hibiscus sabdariffa.*

Reina de las flores. See *Cereus grandiflorus.*

Renealmia.

American tropical herbs, with creeping rootstocks, belonging to the family Zingiberaceae.

Renealmia exaltata.

Reported from Juncos, together with *R. occidentalis.*

Renealmia racemosa.

Grows to a height of 3 feet (1 meter) in moist woods; reported from Sierra de Luquillo.

Reseda. See *Lawsonia alba.*

Originally the Spanish for the mignonette, but transferred in Porto Rico to the henna bush.

Retama. See *Cassia biflora*, *Chamaecrista portoricensis.* and *Sabinea florida.*

Retamo.

A wild tree reaching 50 feet (15 meters) in height, with a trunk 18 inches (45 centimeters) in diameter. Furnishes a white wood that breaks with an oblique fracture. Used as boards in the construction of rude houses, and for other purposes. (Grosourdy, 2: 412.)

Retan.

A tree from all parts of the island; height, 45 to 50 feet (13 to 15 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood, white, hard; specific gravity, 0.904; used in building houses. (Exp. 1857.)

Retomo.

Captain Hansard associates this name with *Spartium scoparium*, which is, according to the Kew Index, synonymous with *Cytisus scoparius.* Specific gravity of wood, 1.11.

Ravenia urbani.

A native species of Porto Rico, belonging to the family Rutaceae, from Sierra de Luquillo.

Reynosia uncinata. CHICHARRON.

Family Rhamnaceae; a shrub or small tree of 8 meters; from limestone mountains about Ponce, Penuelas, and Guanica. *R. krugii*, a somewhat larger species comes from the vicinity of Fajardo and Cayey. (Urban, Symb. 1: 355.)

Rheedia portoricensis. SEBUCAN.

Also called "guyabacoa." Family Clusiaceae; a handsome tree of 10 to 20 meters. The apexes of the thick, shining leaves are produced into sharp points. Found by Sintenis near the seashore at Cangrejos; also reported on the northern coast from between Loiza and San Juan to Vega Baya and Manati; also in the eastern and southern parts of the islands.

Rhexia mariana. CAMACEY-MARIANA.

Family Melastomaceae; a herbaceous annual 20 to 30 centimeters high; found in sandy inundated plains. (Stahl, 4: 118.)

Rhizophora mangle. MANGLE COLORADO. MANGROVE.

Family Rhizophoraceae; a tree 30 to 50 feet (9 to 15 meters) high, forming the mangrove swamps along the coast. The wood is white, but when soaked in water turns red. It is used in boat building and in making hogsheads, etc. (Stahl, 4: 141.)

Furnishes a wood dark red in color, which on account of its great strength is used in the construction of houses and in carpentry work suitable to its small size. It is not very durable except in water, where it is practically incorruptible, especially when nearly submerged. Its most common use is to make a fine grade of charcoal, well adapted for heating the bake ovens; the leaves, or still better, the bark, serve to tan leather. Specific gravity, 1.028. (Grosourdy, **2**: 400.)

Rhoeo discolor. SANGRINARIA.

Family Commelinaceae; a succulent herb with ensiform purple leaves and small white flowers; commonly cultivated.

Rhynchosia. See *Dolicholus.*

Rivina octandra.

Family Phytolaccaceae: a trailing shrub, 4 to 6 meters high. (Grisebach.) Between Sabana Grande and Yauco, growing by roadsides.

Roble. See *Tabebuia rigida*, *Catalpa longisiliqua*, and *Tecoma pentaphylla.*

A tree from all parts of the island; height, 45 to 50 feet (13 to 15 meters); diameter, 15 to 20 inches (37 to 50 centimeters). Wood yellowish, rather hard; specific gravity 0.735; used for lumber. (Exp. 1857.)

Of rather slender habit, reaching perfection on the hills; more like cedar than oak; much used for yokes for oxen and other minor purposes; specific gravity 0.85. (Captain Hansard.)

In Spain this name means "oak;" in Porto Rico it is applied to several trees belonging to the family Bignoniaceae.

Roble amarillo. See *Tecoma stans.*

Roble blanco. See *Tabebuia pentaphylla.*

Roble colorado. See *Tabebuia schumanniana.*

Roble guayo. See *Bourreria succulenta* and *domingensis.*

Roble prieto. See *Tecoma barterii.*

Rondeletia arborescens. See *Rondeletia inermis.*

Rondeletia inermis. CORDOBANCILLO.

A new species recently described by Urban to replace *R. arborescens* and *R. laevigata* of Stahl, which were not correctly identified. An indigenous shrub or small tree belonging to the family Rubiaceae; generally distributed throughout the island. (Urban, Symb. **1**: 416.)

The variety *latifolia* is reported from near Lares, and the variety *oblongifolia* from near Cayey.

Rocon. See *Bixa orellana.*

Rolandra argentea. YERBA DE PLATA.

A woolly composite herb, 60 centimeters high, found in dry, sandy pastures. (Stahl, **5**: 108.)

Rollinia longifolia. ANON.

Family Anonaceae; a tree having a light, tough wood, resembling lancewood. The natives of Guiana and Brazil use it for making spears, according to the Treasury of Botany.

Rollinia mucosa.

Reported from Adjuntas.

Rollinia multiflora. CORAZON CIMMARRON.

A wild tree 25 or 30 feet (7 to 9 meters) high, with a rather straight trunk 8 to 10 inches (20 to 25 centimeters) in diameter. The wood is rather light and soft, fibrous in texture, moderately fine-grained. The color is a handsome dark gray. No known use in Porto Rico. Specific gravity 0.509. (Grosourdy, **2**: 377.)

The habitat of this species is given in Index Kewensis as Guiana.

Rondeletia laevigata. See *Rondeletia inermis.*

Rondeletia portoricensis.

Family Rubiaceae; a tree attaining 20 meters, recently described from specimens obtained at numerous localities—Luquillo, Naguabo, Barranquitas, Peñuelas, Adjuntas, and Maricao. (Urban, Symb. **1**: 414.)

Rorippa nasturtium. WATER CRESS. BERROS.

A cruciferous herb found on banks of rivulets and in wet places. Used for salad. (Stahl. **2**: 36.)

Roseta. See *Myroxylon buxifolium.*

Rosewood.

A name applied to a considerable variety of tropical woods valued for hardness and beauty. The best is said to come from Brazil, and is yielded by *Dalbergia nigra*, a leguminous tree. Three Porto Rican trees, *Cordia gerascanthus*, *Linociera ligustrina*, and *Amyris balsamifera*, have been called rosewood.

Roucou. See *Bixa orellana.*

Said to be a Carib name. Bixa was used by the indigenes to paint their skins red.

Rourea frutescens. JUAN CALIENTE.

Family Connaraceae; said by Bello to exist on the south coast, but not found by Stahl. (Stahl. **4**: 56.)

Rourea glabra. JUAN CALIENTE.

A shrub with long flexible branches, 3 to 4 meters high, from which are made riding whips commonly for sale at wayside shops. The growing plant was pointed out to us at Coamo, and has been reported from Las Marias and Sierra de Luquillo. Bello calls this "bejuco de garrote." (Stahl, **4**: 54.)

Roystonea. ROYAL PALM.

A genus of palms formerly referred to Oreodoxa. See species below.

Roystonea borinquena. PORTO RICAN ROYAL PALM. YAGUA. PLATE XIII.

Family Arecaceae; the royal palm, or "palma real," is not only the more conspicuous and characteristic natural object in most parts of Porto Rico, but it probably exceeds the cocoanut in total economic importance. The most useful part is the yagua, or sheathing base of the leaf, with which a large proportion of the houses of the poorer classes are thatched or sided, or both.

The royal palm is one of the wild species which has been distinctly advantaged by human interference in natural conditions. It is a general fact that outside the climbing species palms are not successful in competing with tropical forest vegetation. Originally the royal palm and the "corozo" were probably confined to the more rugged slopes of the lower limestone hills, where they both still retain a foothold in places where the natural growth seems never to have been cleared away. But the vast majority of royal palms now in existence in Porto Rico stand on land which has been cultivated at one time or another, and where the palms were able to secure a foothold before the competition of other plants became too strong.

The discovery of root tubercles on a young plant of this species has been noted. These tubercles, though small in size, are very numerous upon the smaller roots. In shape they are mostly oval and symmetrical. The larger are about 2 milimeters in length.

Roystonea regia. CUBAN ROYAL PALM

This species does not occur in Porto Rico. The Porto Rican royal palm is now separated under the name *Roystonea borinquena.*

Rubber vine.

In Jamaica this name is applied to *Cryptostegia grandiflora*, one of the Asclepiadaceae introduced from the East Indies, and to *Forsteronia floribunda*, a native species belonging to the Apocynaceae.

These plants have as yet little importance, and are not to be confused with the African rubber vines belonging to the apocynaceous genus Landolphia.

Rubia. See *Fagara monophylla.*

Rubial.

A tree growing near the sea at the east end of the island; natives secure a dye from it, and the wood makes very pretty sticks; specific gravity 0.55. (Hansard.)

Ruda. See *Ruta chalepensis.*

Rudolphia volubilis. BEJUCO COLORADO.

Family Viciaceae; a dark red woody vine, with a rough bark; grows in high altitudes and flowers in winter. Said to be known only from Porto Rico and Mexico. Called "bejuco prieto" by Bello. (Stahl, **3**: 90.)

Ruellia coccinea. YERBA MARAVILLA.

Family Acanthaceae; an erect woody annual, 1 meter high, found in moist shady places in the mountains. (Stahl, **6**: 242.)

Ruellia tuberosa.

A woody herb, 50 centimeters high; grows in dry sandy places along the coast. (Stahl, **6**: 240.)

Rumex crispus. DOCK. VINAGRILLO.

A cosmopolitan weed belonging to the family Polygonaceae; reported from near Maricao.

Russellia juncea. LLUVIE.

Family Scrophulariaceae; a tall, slender herb, cultivated for its handsome tubular red flowers. Our specimen is from Santurce.

Ruta chalepensis. RUE. RUDA.

Family Rutaceae; introduced from the Mediterranean region; collected near Mayaguez, by Krug.

Rynchosia. See *Dolicholus.*

Sabal blackburniana. See *Inodes blackburniana.*

Sabicea aspera. SABICEA PELUDA.

Family Rubiaceae; a woody biennial, 2 to 3 meters high; found in the cool shade of the mountains. Stahl has two species, *S. hirsuta* and *S. hirta*, which, according to the Index Kewensis, are synonyms of *S. aspera*. (Stahl, **5**: 44–45.)

Sabicea hirsuta. See *Sabicea aspera.*

Sabicea hirta. See *Sabicea aspera.*

Sabicea peluda. See *Sabicea aspera.*

Sabinea florida. RETAMA.

Family Viciaceae; a shrub 2 to 3 meters high, found in waste places and along banks of rivers. Flowers in February and March. Common to all the Antilles. (Stahl, **3**: 32.)

Sabinea punicea. CARACOLILLO.

A leguminous plant, supposed to be a shrub. Known from mountain slopes near Mayaguez and Maricao.

Sabino. See *Magnolia splendens.*

This name is given by Hill in a list of trees of the mountains. According to Captain Hansard it is never used alone but always in the form of "laurel sabino," which is believed to be the same as "laurel amarillo."

Sabo. See *Fevillea cordifolia.*

Sacabuche angulosa. See *Physalis angulata.*

Sacabuche peludo. See *Physalis pubescens.*

Saccharum officinarum. SUGAR CANE. CAÑA DE AZUCAR.

Notwithstanding the abundance of printed information, it seems to be still the general opinion that Porto Rico is primarily a sugar island, like so many of the West Indies. The sugar export is greatest in bulk, it is true, being about three times that of coffee, but the total value of the latter is about three times that of the sugar, these two products furnishing about 85 per cent of all the exports of the island.

Sugar lands of limited extent.—Almost all the sugar is grown upon the narrow shelf of level land or coast plain which lies between the sea and the hilly or mountainous interior. The width of this alluvial belt is variable, being in some places entirely absent and in others running back between ranges of hills to the distance of 8 or 10 miles to join the valleys of some of the numerous rivers. Very little cane is raised in the interior valleys of the island, perhaps the most notable exception being that of Caguas, where there are a few factories, and where cane is sometimes planted on hilly, unirrigated land, but seems not to thrive, and "arrows," or flowers, while still very short. In some districts of the north side of the island the level sugar land is interspersed with the characteristic small, conical, limestone-capped, and verdure-covered hills, which give the cane fields the pleasing effect of a succession of valleys, as in the region between Carolina and the coast.

The difficulties of transportation forbid much development for the present in remote and detached areas, even when the natural conditions are favorable.

Modern methods of sugar production require that the business, to be profitable, should be conducted on a large scale, the manufacturing side being so important a part of the industry. For the best results plantations of 2,000 to 5,000 acres or more are required, conveniently located for access to the factory.

More factories than cane.—In Porto Rico the use of fertilizers or of a system of rotation with pasturage is necessary, and in the latter case the plantation must be twice the area from which sugar is to be harvested, besides necessitating a resort to the annoying complexities of mixed farming, with which the ordinary sugar capitalist has little patience. The anxiety to secure returns with unreasonable rapidity is already responsible for many failures in the sugar business in Porto Rico. Much of the sugar land has been under cultivation for more than a century, and it is only on that which, for some exceptional reason, has never been used, or has been fallow or in pasturage for many years, that an average much over a ton can be obtained for even a brief series of years. The fertility of some estates is, however, maintained by material deposited by high water from neighboring streams.

The tendency to larger factories.—Some large estates, representing investments of several hundred thousand dollars, have been operated at a loss or have realized merely low rates of annual interest. Most of these have, however, failed to secure the maximum profits from lack of sufficient cane to keep their factories running throughout the harvest season. In larger concerns and better organizations lie the future possibilities of the sugar industry of Porto Rico. At points where the coast plain is wide, large tracts of conveniently located cane lands might be rendered tributary to a single factory by purchase, by lease, or by contract with the several owners. Such combinations are already under way. This will mean local expansion of the sugar industry, but the gain will be doubtless partially offset by the abandonment of many estates not located so as to be brought within the lines of the reorganization. The small, poorly equipped factories are at a disadvantage on all sides. Supplies, equipments, and management cost more in proportion to the results. They are unable to use the bagasse for fuel, or are under the necessity of putting it out to dry in the sun before burning. They lose a considerable percentage of sugar from imperfect extraction, and the inferior product commands a lower price in the market.

Present tendencies are all in the direction of larger sugar mills and it is not considered good business policy to erect plants capable of caring for less than 500 tons of cane a day. Such mills cost between $300,000 and $500,000, and will handle the cane from 3,000 or 4,000 acres of land, depending, of course, upon the fertility. Where transportation facilities are not unreasonably expensive it is considered more profitable to ship cane by rail 20 or 30 miles, or even farther, than to establish smaller factories for manufacture near the fields. Much of the labor of shipment is now accomplished by machinery, and when the cane is once on wheels increased distance affects but slightly the cost of transportation.

Sugar varieties.—Numerous varieties of sugar cane are grown in Porto Rico, many plantations having a very miscellaneous assortment. Bourbon cane has been generally most popular, but the Salangora variety has been preferred of late as more resistant to disease. The purple or Guadaloupe cane is found in larger or smaller quantity in most plantations, but some of the more intelligent and progressive managers have taken the trouble to eradicate it for the reason that they consider it inferior both in quantity and quality, since the juice is said to contain a large amount of gum which renders the sugar of low grade.

The Porto Rican planters should have the advantage as soon as possible of whatever can be learned concerning the numerous experiments in sugar culture and the selection of superior varieties of cane in the British West Indies. Extensive experiments of this kind have been carried on in British Guiana, Barbados, and elsewhere, and the adaptation of varieties of soils has also received attention.

At a meeting of the West Indian agricultural conference in Barbados the results of experiments in sugar culture in British Guiana and Barbados were discussed. The necessity of nitrogenous fertilizers being agreed upon, the desirability of extended trials of leguminous crops was urged as the most practical and economic manner of maintaining the fertility of the soil.

Sagraea fascicularis. CAMACEY DE PALOMA.

Salcilla. See *Morongia leptoclada.*

Salicornia. SALTWORT.

A genus of chenopodiaceous herbs; an unidentified species reported from Cabo Rojo along the seashore; rare.

Salix humboldtiana.

Family Salicaceae; the only member of this willow family mentioned by Grisebach; reported from near Maricao.

The curious spire-like trees in the cemetery at Utuado are referred to this species.

Salmea eupatoria. BEJUCO DE MIEL.

An annual or biennial composite shrub 2 meters high, growing in waste places. Flowers have a pronounced odor of honey. (Stahl, **5**: 139.)

Salmea grandiceps. See *Salmea eupatoria.*

Salmea scandens.

A trailing shrub from Manati. According to Grisebach, found in the mountains of Cuba, Haiti, and Porto Rico.

Salvia. See *Pluchea odorata.*

Salvia coccinea. MORADILLA ENCARNADA.

An erect, woody herb of the mint family, both wild and cultivated in gardens. (Stahl, **6**: 201.)

Salvia occidentalis. MORADILLA AZUL.

An herbaceous annual, 50 centimeters high, distributed over the island. Sweet-scented and sometimes used on account of its balmy odor. (Stahl, **6**: 200.)

Saman. See *Pithecolobium saman.*

Sambucus canadensis. ELDERBERRY. SAUCO.

Family Caprifoliaceae; a shrub 3 to 4 meters high; cultivated in gardens, the fragrant flowers used as a sudorific. (Stahl, **6**: 23.)

Samyda glabrata. GIA.

Family Flacourtiaceae; a shrub 3 to 4 meters high; in mountains and waste places, preferring cool shades. (Stahl, **4**: 34.)

Samyda serrulata.

Reported from Fajardo.

San Bartolome. See *Cordia sebestana.*

Sandbox tree. See *Hura crepitans.*

Sandía. See *Citrullus vulgaris.*

Sangre de doncella. See *Byrsonima lucida.*

Sangrinaria. See *Rhoeo discolor.*

Sansevieria sp. LENGUA DA VACA.

Family Liliaceae; a species of this genus is found in various parts of the island, cultivated as an ornamental or escaped. No use is apparently made of this excellent fiber, which is said to be preeminently suited for sailmaking and as a covering for submarine cables, as it resists the action of salt water to a remarkable extent.

Santa Maria. See *Eupatorium odoratum, E. polyodon*, and *Vernonia longifolia.* Also *Lantana involucrata*, and *Thespesia populnea.*

Sapindus inaequalis. See *Sapindus marginatus.*

Sapindus marginatus. JABONCILLO.

Family Sapindaceae; this species is separated from *S. saponaria* by having the rachis of the leaves marginate and not winged; not known to Stahl. (Stahl, **2**: 160.)

Sapindus saponaria. JABONCILLO.

A tree 6 to 8 meters high, found wild only on the south coast. The fruit, called soapberries, yields a watery juice used as a substitute for soap. Common to the Antilles and tropical America. (Stahl, **2**: 159.)

Sapium sebiferum. TALLOW TREE. ÁRBOL DE LA CERA.

A Chinese Euphorbiaceous tree, cultivated in Cuba under the names "árbol del sebo," "cera," and "árbol de la cera;" reported from Porto Rico by Hill as *Stillingia sebifera* and erroneously confused with the bixa or achiote (*Bixa orellana.*) A brittle wax, used for the manufacture of candles, is secured from a layer of oily matter covering the seeds. The Chinese are said to use the very hard wood for printing blocks and the leaves for preparing a black dye.

Sapodilla. See *Achras sapota.*

Sapota achras. See *Achras sapota.*

Sapota sideroxylon. See *Achras sapota.*

Sapote de costa. See *Mimusops globosa.*

Sarbatana. See *Synedrella nodiflora.*

Sarcomphalus laurinus. See *Sarcomphalus retusus.*

Sarcomphalus reticulatus.

Native names, "espejuelo," palo de hierro," "cacao rojo." A shrub or small tree, 5 to 8 meters high, of the family Rhamnaceae. Known from littoral forests along the south side of the island. (Urban, Symb. **1**: 357.)

Sarcomphalus retusus.

Family Rhamnaceae. (Stahl, **4**: 44, as *Sarcomphalus laurinus.*)

Sarna de perro. See *Casearia sylvestris.*

Sarsaparilla.

In the market of Ponce this name was applied to what were said to be the roots of the maguey or agave, used as a remedy for diseases of the blood.

Satinwood. See *Fagara flava.*

Sauco. See *Sambucus canadensis.*

Sauvagesia erecta. YERBA DE SAN MARTIN.

Family Ochnaceae: an herbaceous annual, 30 to 40 centimeters high. (Stahl, **2**: 49.)

Savia sessiliflora.

Family Euphorbiaceae: reported from Cayey.

Schaefferia frutescens.

Family Bignoniaceae; a glabrous shrub 10 feet high (3 meters), from Manati; in thickets along the shore.

Schlegelia axillaris. HIGUERITO DE SIERRA.

Family Bignoniaceae; a shrub, 3 meters high, along the foothills. (Stahl, **6**: 185.)

Schlegelia brachyantha. HIGUERITO DE SIERRA.

An indigenous woody vine with elliptical or obovate leathery leaves. The variety *portoricensis* has been described recently from several localities in different parts of the island. It was collected by Sintenis, who reports the original native name "tulipa." Professor Urban notices in this variety the first instance of dimorphous styles in the present family. In some flowers the stigmas extend far beyond the anthers, while in others the reverse is true. (Urban, Symb. **1**: 406.)

Schmidelia occidentalis. See *Allophylus occidentalis.*

Schoepfia obovata.

Family Oleaceae: known from Guanica.

Schradera capitata. SCHRADERA EN CABEZUELAS.

Family Rubiaceae; a woody herb, climbing or twining: sometimes parasitic; found in the high mountains. (Stahl, **5**: 39.)

Schradera en cabezuelas. See *Schradera capitata.*

Schrankia. See *Morongia.*

Sciadophyllum jacquini. See *Hedera arborea* and *Gilibertia arborea.*

Scolosanthus grandifolius. ESPUELA DE GALAN.

Also called "picha de gato." A rubiaceous shrub, from the vicinity of Maricao. (Urban, Symb. **1**: 442.)

Scolosanthus versicolor.

A shrub 2 to 3 meters high, known from Humacao.

Scoparia dulcis. OROZUZ.

Family Scrophulariaceae; a woody annual, 50 centimeters high, common to all parts of the islands. Supposed to be a remedy for coughs in Jamaica, where it is called "licorice weed." Specimens were collected at Condado, near Santurce, and at Loa Alta, the latter with the name Culantrillo. Bello calls this "escobita amarga." (Stahl, **6**: 226.)

Screw pine. See *Pandanus.*

Scrophularia micrantha. PEREGIL CIMARRON.

An annual herb indigenous on the south side of the island. (Urban, Symb. **1**: 403.)

Scutellaria. ALBAHACA.

The name "albahaca" is used at Rio Piedras for a species of Scutellaria (No. 1003).

Scutia ferrea. PALO DE HIERRO.

Family Rhamnaceae; a tree or shrub, 4 meters high, reported from the east coast by Stahl; flowers in the fall. (Stahl, **4**: 41, as *Condalia ferrea.*)

Sea-grape. See *Coccolobis.*

Seboruquillo. See *Thouinia striata.*

Sebucan. See *Rheedia portoricensis* and *Cereus swartzii.*

Seburoquillo. See *Thouinia striata.*

Also spelled "seburuquillo" and "seboruquillo."

Seca-garganta. See *Parathesis crenulata.*

Sechium edule. CHAYOTE.

This is a Mexican plant of the family Cucurbitaceae; it was cultivated by the Aztecs and called chayotli, from which the modern Mexican name chayote is derived; in Porto Rico a further modification into tayote or tallote is generally current, while elsewhere in the West Indies the form chocho seems to be most common though chuchu, choko, chahiota, and other corruptions have been made. In some of the French islands it is called "christophine" and in Madeira "pipinella." "Vegetable pear" is also given as an English colonial name.

The chayote differs from all other vegetables of the squash family in having but a single seed, which is embedded in the otherwise solid flesh of the deeply grooved and usually spiny fruit. The fruits generally are more or less pear-shaped, but one green variety is long and pointed, while a white sort is nearly spherical. The color is green in some cases and white in others and the larger sorts are twice or three times the size of the smaller. The spines seem to be very variable in size and number, and varietal differences are to be indicated by form and color rather than with reference to the spines. Thus we found in Porto Rican markets at least five varieties of chayote. Although the spines are weak and fleshy and not able to puncture the skin or cause discomfort in handling the fruit, the smooth varieties are probably more desirable for market cultivation, since the spines become bruised and broken in transportation and might thus induce decay. To what extent the flesh of the different varieties differs in quality is not known with certainty. In Madeira a green variety is considered superior to another described as cream-colored, while in Jamaica a white sort has been indicated as "by far the more delicate." External bruises discolor more on the white than upon the green fruits, but on the other hand the white chayote in good condition appears more delicate and appetizing than the green, and this superior appearance might easily give it an advantage in the market.

In addition to the fruit, the chayote is valued for another useful product in the form of the edible, fleshly perennial root, which sometimes weighs as much as 20 pounds. This contains starch to the extent of 20 per cent of its weight in the fresh condition, and the taste and texture are said to be very similar to those of the true yam.

Ever since the Spaniards made the acquaintance of this plant in Mexico its culture in other countries has been extending. At present it is known throughout tropical America, and it has long been established in Madeira, where English travelers have often become acquainted with it. The Kew Gardens have within the last two decades sent it to many points in British India and other tropical and subtropical colonies, including St. Helena. It is also becoming known in Southern Europe and North Africa. Considerable quantities of chayotes are now being imported from Algeria to France, where they are largely used in making a substitute for *fonds des artichauts*, the basal part of the receptacle of the flower head of the true artichoke. This is cut in slices and is in much demand for special dishes, but it has been found that the texture and flavor of the chayote permit it to replace the artichoke if cut into disks so as to give the same external appearance. The chayote has also been grown for many years in California, and in a limited area about New Orleans.

The fact that the root is perennial will make it possible to grow the chayote, with slight protection, wherever the ground does not freeze. It seems to have originated in an elevated region and does not thrive as well at sea level in the Tropics as in the mountains or subtropical regions. The vine, which suggests that of the cucumber, is vigorous and fairly hardy, and is not known to suffer from the attacks of insects or parasitic fungi, so that the chayote may be considered a particularly reliable crop, in view of the utility of both the fruit and the root.

Of the value of the chayote for food purposes very different opinions have been expressed, some writers reporting it as insipid and scarcely edible, while others have compared it with the vegetable marrow and pronounced it superior. Those who are fond of summer squashes will probably have no difficulty with the chayote, and may prefer it on account of its better texture and more delicate flavor. Although firmer than the squash, the flesh is not tough or fibrous, and eaten simply with salt and pepper the chayote is an agreeable vegetable.

The question whether the chayote may not have a future as an article of export to temperate regions naturally suggests itself. It is not likely that competition with temperate vegetables will arise, but, on the other hand, it seems entirely probable that in the winter and spring the chayote would find sale at least in our city markets when once it had become known to the American public. The plant is not only perennial, but ever-bearing, and in connection with a fruit trade or other regular means of communication the shipment of chayotes at the proper season might be found advantageous. At the time of our visit it seemed to rank among the more important of the fresh vegetables for sale in the markets of Porto Rican towns. Many Americans had not, however, learned to make use of it, and others did not even know its name or nature, while the few who had tried it in most cases reported favorably. Adverse opinions of new fruits are often the result of acquaintance gained under unfavorable circumstances, and before deciding adversely on an article of food it is always well to make sure that the samples tested are of good quality and have been well prepared from the standpoint of those who understand their use.

In any attempt which may be made for the commercial production of the chayote an initial difficulty will probably be experienced, due to the fact that the species multiplies slowly on account of the single-seeded character of the fruit.[a]

Secua. See *Fevillea cordifolia.*

Securidaca virgata. BEJUCO DE SOPLA.

Family Polygalaceae; a reclining shrub 3 meters high, found in waste places; reported from Mayaguez. (Stahl, **2:** 54.)

Sen de dos hojas. See *Chamaecrista diphylla.*

Sen del pais. See *Cassia laevigata* and *C. bicapsularis.*

Sen de palillos. See *Cassia bacillaris.*

Sen obtusifolia. See *Cassia tora.*

Sepi. See *Neurolaena lobata.*

Serasuelo. See *Eugenia serrasuela.*

Possibly an error for "cerasuelo."

Serillos. See *Meliosma obtusifolia.*

Serjania curassavica. See *Paullinia pinnata.*

Serjania lucida. BEJUCO DE CORRALES.

Family Sapindaceae. A woody annual or biennial vine-like shrub, in waste places along the shore. (Stahl, **2:** 154.)

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[a] For a more complete discussion of this plant see Bull. 28 of the Div. of Botany, U. S. Dept. Agriculture.

Serjania triternata. See *Serjania lucida.*

Serra-suola. See *Thouinia portoricensis.*

Perhaps another spelling of "cerasula."

Sesamum indicum. See *Sesamum orientale.*

Sesamum orientale. SESAME. AJONJOLÍ.

This well-known tropical plant has received, in addition to the above, a confusing variety of names, such as benne, benni, benny, gingili, gingeley, gingely, and gingelly, teel, and til. The Spanish name is also spelled "aljonjoli." Sesame was originally a native of India, but is now cultivated throughout the Tropics and can be grown successfully in almost any region where three or four months of warm moist weather can be assured. Loose and well-drained soils with plenty of lime are most desirable, and nitrogenous fertilizers are said to have a very pronounced effect upon the yield and the rapidity of growth.

Sesame is cultivated for the sake of the oily seeds which form a staple article of diet in all the countries of tropical Asia, in many regions second only to rice and in some exceeding it in importance. The roasted seeds have a very pleasant nutty flavor and may be eaten without other preparation, but they also appear as an important ingredient in endless kinds of soups, pastries, confections, and other dishes.

Sesame oil is, however, the principal product and the object of the export trade to Europe. The oil answers the same purpose as olive oil and is largely used as an adulterant or substitute in the same way as cotton-seed oil, and was formerly second only to cocoanut oil in the amount imported into Europe. Marseilles is by far the largest center for receiving and extracting the oil, the annual importations reaching 175,000,000 pounds. From the seeds can be extracted from 40 to 50 per cent of their weight in oil, and the residuum is in regular demand as oil cake for use as fodder and fertilizer.

Only the white variety of sesame was observed in Porto Rico. This is considered to yield oil of the best color and flavor, though a black variety extensively cultivated in India is said to yield a larger quantity. In Porto Rico the culture of sesame is carried on mostly as an incidental crop intermixed with corn, beans, and bananas. On the south side of the island a few well-kept though small fields of sesame were noticed. It is planted in rows 18 to 24 inches (45 to 60 centimeters) apart, with the seeds 3 inches (7 centimeters) apart in the row, to be later thinned to 18 inches when the plants reach a height of 3 to 4 inches. It is considered important that the ground should be in a very finely pulverized condition, and repeated plowing is practiced in India. Very shallow sowing is advised, and careful hoeing and weeding, but this need not be long continued, since the sesame grows with extreme rapidity and soon shades the ground completely. The crop is allowed to ripen thoroughly, but cutting takes place before the capsules begin to open. A scythe or sickle may be used, the plants being cut off near the ground and allowed to dry further in small piles.

Sesbania. See *Sesbania occidentalis.*

Sesbania grandiflora. See *Agati grandiflora.*

Sesbania occidentalis. SESBANIA.

Family Viciaceae. A shrub 2 to 3 meters high, found along the west coast. Flowers in March; legumes, 10 to 12 centimeters long. (Stahl, **3**: 30.)

Sesbania sericea.

A woody herb, with a long slender legume, reported from Anasco; also collected by Heller near Mayaguez.

Shaddock. See *Citrus decumana.*

Sicana odorifera. PEPINO ANGOLO.

Family Cucurbitaceae; a vine bearing a large yellowish red or purple fruit 12 or 18 inches (30 to 45 centimeters) long and 3 or 4 inches (7 to 10 centimeters) in diameter, remarkable chiefly for its delightful and penetrating odor, which is said to keep away insects. The fruit is also eaten, but the taste is rather insipid. In the market at Mayaguez the larger fruits were valued at 10 cents each, but there appeared to be no regular demand for them. One specimen of this fruit was found in the Washington market.

Siciliana. See *Mirabilis jalapa.*

Sida carpinifolia. See *Escoba blanca.*

Sida ciliaris. Escoba pestañada.

Family Malvaceae: an under-shrub, 30 centimeters high, growing prostrate in dry savannas. (Stahl, **2**: 63.)

Sida cordifolia. Escoba acorazonada.

An annual woody herb, 1 meter high, found in dry sandy places. (Stahl, **2**: 68.)

Sida jamaicensis. Escoba de Jamaica.

A diffuse shrub, 40 to 50 centimeters high, with velvety leaves. (Stahl, **2**: 62.)

Sida purpurea. Escoba purpurina.

A reclining woody annual, 1 meter high, found in many parts of the island. (Stahl, **2**: 65.)

Sida rhombifolia. Escoba colorada.

An annual or biennial shrub, 50 centimeters high, found in all parts of the island. This is one of the most widely distributed of all tropical plants. (Stahl, **2**; 64.)

Sida supina. Escoba tendida.

An herbaceous annual found in dry, stony places, 30 to 40 centimeters high; known from Guanica. (Stahl, **2**: 67.)

Sida ulmifolia. Escoba dulce.

A woody annual, 1 meter high, from many parts of the island. Bello gives the common name as "escobita dulce." (Stahl, **2**: 66.)

Sida viscosa. See *Bastardia bivalvis.*

Sideroxylon foetidissimum.

Family Sapotaceae; known from the mountains about Utuado. (Sintenis.)

Sideroxylon mastichodendron. Tortugo amarillo. Ausubo.

A tree 10 to 15 meters high; wood solid, and used in making furniture; found at all altitudes; flowers in June; common to many of the Antilles. (Stahl, **6**: 58, as *Sideroxylon pallidum.*)

According to Captain Hansard, it is called "bullet wood" in the British West Indies. Much used for building. Specific gravity, 1.09.

Sideroxylon pallidum. See *Sideroxylon mastichodendron.*

Sionoguillo. See *Eugenia confusa.*

This native name, recorded by Urban on the authority of Sintenis, is doubtless an error for "cienequillo;" also applied to other Myrtaceae. A tree from all parts of the island; height, 12 to 15 feet (4 to 5 meters); diameter, 3 to 4 inches (7 to 10 centimeters); wood ash-colored, hard; specific gravity, 1.039; used in building houses. (Exp. 1857.) (Grosourdy, **2**: 413.)

Sioto cucros.

A tree from the beaches of the island; height, 30 to 35 feet (9 to 11 meters); diameter, 12 to 15 inches (30 to 37 centimeters); wood ash-colored, very hard; specific gravity, 0.961; used for cabinetwork (Exp. 1857) and in boat building. (Grosourdy, **2**: 414.)

Silk. See note under *Morus.*

Silk-cotton tree. See *Ceiba pentandra.*

Simaruba amara. See *Simaruba tulae.*

Simaruba tulae. ACEITILLO.

A tree 8 to 15 meters high; in primeval forests at an altitude of 600 to 800 meters; known from the Luquillo Mountains near Banadero, and from Juncos, Adjuntas, Penuelas, and Maricao. Reported by Bello as *S. amara*, but that species is believed not to exist in Porto Rico, being confined to the more southern islands, while the Porto Rican plant is distinct in having the petals much longer and the staminal scales smooth. (Urban, Add. **1**: 18.)

Sinapis brassicata. See *Brassica juncea.*

Sisal hemp. See *Agave sisalana.*

Sloanea berteriana.

Native names: "Cacao roseta," "cacao otillo," "cacaillo," "motillo." An indigenous tree of 8 to 30 meters; family Tiliaceae; known from mountain forests near Luquillo, Sierra de Naguabo, Yabucoa, Adjuntas, and Maricao. (Urban, Symb. **1**: 359.)

Smilax havanensis.

An indigenous, shrubby, climbing vine, growing at Cabo Rojo. It is closely related to the cat-brier of our Eastern States. The variety *portoricensis* is known from the vicinity of Maunabo.

Snake-wood.

In the British West Indies; applied to *Cecropia peltata* and *Colubrina ferruginosa.*

Solanum asperum. TABACON ÁSPERO.

Family Solanaceae; a spineless shrub, occurring at the bases of mountains and in waste places; 2 to 3 meters high. (Stahl, **6**: 138.)

Solanum callicarpifolium. BERENJENA DE PALOMA.

A shrub, 3 meters high. The entire plant covered with dense hair; found in waste places. (Stahl, **6**: 276.)

Solanum caribaeum. MATA-GALLINAS.

A smooth, herbaceous annual, 80 centimeters high; common to all parts of the island. (Stahl, **6**: 129.)

Solanum guaniconse.

A rather small, annual species recently described from the vicinity of Guanica.

Solanum igneum.

A prickly shrub; known from Guayama.

Solanum inclusum. BERENGENA CIMARRONA.

An erect shrub, 2 meters high; found at base of mountains and in cool, shady places. (Stahl, **6**: 133.)

Solanum jamaicense. BERENGENA JAMAIQUIÑA.

A biennial shrub; found in shady, waste places; 2 meters high. (Stahl, **6** : 131.)

Solanum lentum. BERENGENA DE PALOMA.

A decumbent shrub; found in cool places and at the base of mountains; known from Hate Grande. (Stahl, **6**: 128.)

Solanum mammosum. SUSUMBER. BERENGENA DE MARIMBO.

Also "soushumber." A woody annual, densely pubescent, 1 meter high; found in shady places near cultivated fields. (Stahl, **6**: 134.)

A common, tropical weed used in Jamaica as a stock for grafting the eggplant.

Solanum melongena. EGGPLANT. BERENGENA.

The eggplant is rather commonly cultivated in Porto Rico and seems to thrive better than most garden vegetables, perhaps because it is of tropical origin and has not been selected for a very long period in temperate regions. Nearly all the fruits seen in the markets were very small, and there seemed to be but one variety represented, of a light purplish or lavender color. In gardens the plants were mostly of small size and apparently rather sickly. In Jamaica similar difficulties in bringing the plants to a healthy maturity have been met by grafting the eggplant on *Solanum mammosum*, the so-called "susumber tree," a rank tropical weed closely related botanically to the eggplant. The grafts are said to produce fruits of large size and fine flavor, and, as the stock is perennial, bearing is continual. The process of grafting has been described as follows:

> The stock is cut to the depth of 1½ inches with a sharp knife and the cleft kept open till the scion is inserted. The scion (a piece of growing branch of garden egg about twice as thick as an ordinary lead pencil and about 4 inches long) is cut wedge-shaped and inserted in the cleft, so that the inner barks may coincide. It is then wrapped with soft string or woolen yarn and covered with a handful of clay. There should be no bark left upon the inserted part of the scion except that on the outside.

It is considered advisable to pick off the flowers which may form during the first two or three months, in order to permit the plant to make vigorous growth. A contributor to the January number of the Jamaica Agricultural Society claims to have picked at least 250 fruits from such a tree, and adds:

> The tree is now about two years old, and so far from showing any signs of decay, it is increasing in size, and at the time of writing is covered with both bloom and fruit. I have from time to time pruned it in the same manner as a coffee tree, leaving the center open, cutting off dead wood, and encouraging lateral growth. Buds take very readily, and a few put into susumber bushes in a rich spot near a dwelling would amply repay those who value the vegetable for home use.

If these representations are correct, it would seem that this method of growing eggplants for commercial as well as for domestic purposes, is far preferable to permitting the plant to depend upon its own roots. The raising of seedlings is a difficult and uncertain process, owing to the attacks of insects and other adverse possibilities. Transplanting and watering are also troublesome and costly, and if all goes well only ten or a dozen marketable fruits are to be expected from each plant. The use of the more vigorous and hardy stock of the unimproved species offers, it would seem, every advantage in the way of protection against accidents or adverse conditions, saves labor, and would be much more remunerative. Another most important consideration also suggests itself. By pinching off the flowers during the seasons when fruit is not desired for market, the energies of the year's growth could be concentrated upon production in the months when shipping appeared most advantageous, or during the early winter months before the Florida crop is ready.

It is to be expected that such a possibility as the present will be duly appreciated by those interested in the production of vegetables in Porto Rico. The experiment is easy and inexpensive, and should be tried for the tomato as well as the eggplant, and with other wild species of Solanum where these are locally abundant and vigorous. In Porto Rico *Solanum torvum* (see below) is an extremely common weed along roadsides and in waste places generally. It has a strong, erect habit, and is a near relative of the eggplant, so that it seems quite probable that grafting would be found easily practicable.

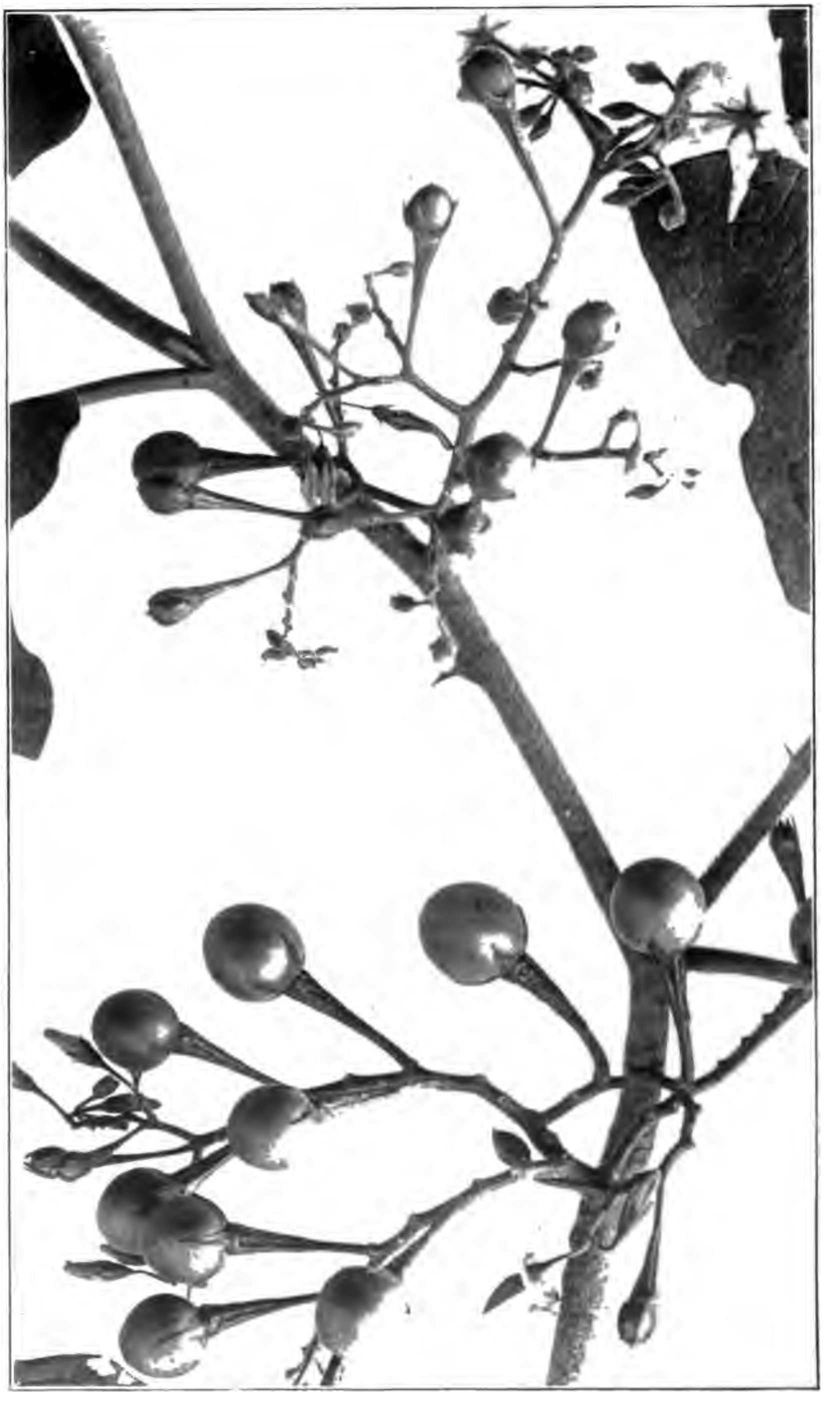
Solanum nigrum. BLACK NIGHTSHADE. YERBA MORA.

Specimens obtained at Ponce (No. 779) not noted elsewhere and not reported by Stahl.

The plant is reputed poisonous, but the berries are often eaten.

Solanum persicaefolium. BERENGENA DE PLAYA.

A branched shrub found along sandy beaches; 1 meter high. (Stahl, 6: 180.)



BERENGENA CIMARRONA (SOLANUM TORVUM).

Solanum seaforthianum. FALSA BELLADONA.

A biennial climbing or trailing vine 2 to 3 meters high; cultivated in gardens for its handsome flowers. (Stahl, **6**: 137.)

A plant that was taken for this species was called "aguinaldo" at Cataño.

Solanum torvum. BERENGENA CIMARRONA. PLATE LV.

This is a rank, shrubby species, very abundant in Porto Rico. It may also be found useful as a stock on which to graft the eggplant. See *Solanum melongena* at end. (Stahl, **6**: 132.)

Solanum tuberosum. POTATO. PATATA.

The potatoes are usually called "papas" in Spanish countries, although "patata" is generally recognized as the more correct form of the word.

Solanum verbascifolium. TABACON AFELPADO.

A woody shrub, 2 meters high, found in waste places. (Stahl, **6**: 139.)

Solanum virgatum. BERENGENA DE PALOMA.

(Stahl, **6**: 275.)

Sonajuelas. See *Crotalaria retusa.*

Sonchus arvensis. CHICORIA.

Reported by Bello.

Sonchus oleraceus. CHICORIA.

An herbaceous composite weed, common to all the world. (Stahl, **5**: 154.)

Souari nut. See *Caryocar nuciferum.*

Sour grass.

A name applied to various species of Paspalum.

Sour orange. See *Citrus bigaradia.*

Sour sop. See *Anona muricata.*

Soushumber. See *Solanum mammosum.*

This is also spelled "susumber," and is a Jamaica name.

Spanish cedar. See *Cedrela odorata.*

Spanish elm. See *Cordia gerascanthoides.*

Spanish plum. See *Spondias purpurea.*

Sparganophorus vaillantii. YERBA DE FAJA.

A composite herb, 50 centimeters high, common throughout tropical America. (Stahl, **5**: 100.)

Spermacoce ocymoides. BOTONCILLO.

Family Rubiaceae.

Spermacoce parviflora. CLAVELILLO.

Specimens from Toa Alta (no. 882).

Spermacoce portoricensis. POAYA.

An herbaceous annual, 50 centimeters high, found in dry pastures. (Stahl, **5**: 87.)

Spermacoce verticillata. BOTON BLANCO. BOTON BLANCO DE ARENALES.

Stem shrubby, 3 or 4 feet (about 1 meter) high, growing preferably in dry soil. Specimens from Lares are in the National Herbarium (Sintenis, no. 5082).

Sphenoclea zelanica. CAMPANILLA.

Family Campanulaceae; an herb found in inundated places. (Stahl, **6**: 32.)

Spiderwort. See *Tradescantia.*

Spigelia anthelmia. YERBA DE LOMBRICES.

Family Loganiaceae; an herbaceous annual, 30 centimeters high, found in cultivated fields. This plant has strong narcotic and anthelminthic properties. Bello records the common name "lombricera." (Stahl, 5: 54.)

Spilanthes uliginosa. See *Spilanthes acmella.*

Spondias dulcis.

Family Anacardiaceae; a tree cultivated for its edible fruits throughout the Tropics; reported from Peñuelas.

Spondias lutea. HOG PLUM. JOBO.

Family Anacardiaceae; one of the most common trees in Porto Rico, planted extensively for shade and for the sake of its edible fruits. It grows readily from large cuttings, and with *Bursera simaruba,* the "almacigo," is preferred for stakes and fence posts, which are durable because they take root and remain alive. The fruits are oval and attain a length of 1½ inches. The skin is very thin and incloses a pleasantly acid pulp surrounding the nut-like seed. The tree attains a height of 40 feet (42 meters) or more, and a diameter of from 1 to 2 feet (30 to 60 centimeters), but the wood is light and soft (specific gravity 0.457), and is very little used except in the way explained above. The fruits of this species are yellow, and are said to be inferior to those of *Spondias purpurea.* "Hog plum" is a Jamaica name and does not, as might appear, involve any reflection on the quality of the fruit, but refers to the fact that hogs are extremely fond of this fruit, on which they fatten rapidly.

Grosourdy gives the specific gravity of the wood as 0.508 and says that it is strong and elastic, yellowish-brown in color, so marked as to give a pleasing appearance. (Grosourdy, 2: 393.)

Spondias purpurea. CIRUELA DEL PAIS.

A tree or shrub 4 to 5 meters high, introduced from South America. Cultivated in gardens for its agreeable, deep purplish-red fruits, which are considered better flavored than those of *Spondias lutea.* (Stahl, 4: 57.)

Stachytarpha. See *Valerianodes.*

Stachytarpheta. See *Valerianodes.*

Stahlia maritima. COBANO.

Also called "polisandro." Described as a magnificent, widely branching, indigenous, leguminous tree, 5 to 20 meters high, known from the seashore near Rio Grande, Ceiba, Naguabo, Guanica, Barinas, and La Plata. (Bello, Stahl, Urban.)

Star apple. See *Chrysophyllum cainito.*

Stave wood. See *Simaruba amara.*

Stemmodontia affinis.

A composite shrub, reported from Fajardo, near the seashore.

Stemmodontia buphthalmoides. MANZANILLA DE COSTA.

An erect shrub, 75 centimeters high, reported once by Stahl from the east coast. (Stahl, 5: 138, as *Wedelia buphthalmoides.*)

Stemmodontia carnosa. MANZANILLA DE LA PLAYA.

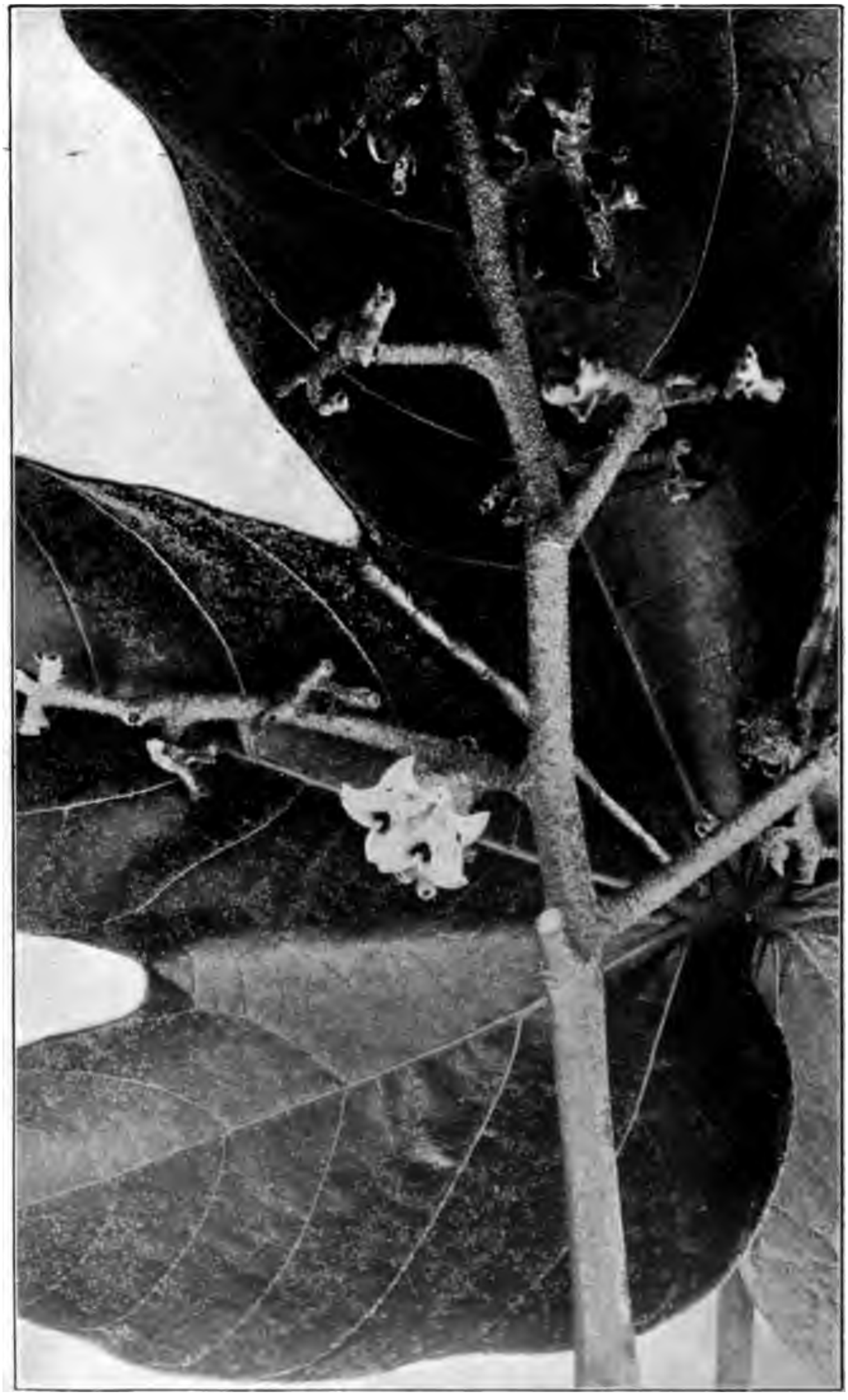
A common herbaceous annual weed preferring sandy soils and open grounds. It was very common about Santurce, where it was called "manzanilla cimarrona." (Stahl, 5: 135, as *Wedelia carnosa.*)

Stemmodontia lanceolata.

Reported from Guanica.

Stemmodontia reticulata. MANZANILLA DE MONTE.

A woody biennial, 80 centimeters high, found in waste places in the foothills. (Stahl, 5: 136, as *Wedelia reticulata.*)



ANACAGÜITAS (STERCULIA CARTHAGINENSIS). NEAR PONCE.

Stemodia durantifolia. VERONICA.

Family Scrophulariaceae; an herbaceous annual, 30 centimeters high. In Jamaica various medicinal properties are attributed to it. (Stahl, **6**: 237.)

Stemonacanthus coccineus. See *Ruellia coccinea.*

Stenolobium caeruleum. See *Calopogonium caeruleum.*

Stenostomum lucidum. See *Antirrhoea floribunda* and *A. lucida.*

Stenostomum resinosum. See *Laugeria resinosa.*

Sterculia carthaginensis. ANACAGÜITAS. PLATE LVI.

A fine South American tree, with large 5-lobed leaves. The flowers are very white, streaked and spotted with dull purple. A single specimen was seen in a dooryard along the road between Ponce and Adjuntas. A decoction is believed to be beneficial in catarrhal affections, and the popular name may have been applied on this account, being used in Mexico for species of Cordia supposed to have similar properties.

Stigmatophyllon chrysophylla. See *Heteropteris bellonis.*

Stigmatophyllon floribunda. BEJUCO DE PARALEJO.

Family Malpighiaceae; a vine found on the south coast. (Stahl, **2**: 147.)

Stigmatophyllon periplocifolium. BEJUCO DE PARALEJO.

Not known to Stahl, but reported from the south coast. (Stahl, **2**: 147.)

Stigmatophyllon puberum. BEJUCO DE PARALEJO.

A pubescent vine found flowering at Humacao. (Stahl, **2**: 146.)

Stillingia sebifera. See *Sapium sebiferum.*

Strainer vine. See *Luffa acutangula.*

Strawberries.

No record of the introduction of strawberries into Porto Rico has been found, but they are grown successfully on the mountains in Jamaica.

Stylosanthes procumbens. ZARZABACOA ENANA.

Family Viciaceae; an herbaceous pubescent herb, 30 centimeters high, found along sandy coasts. Our specimens were obtained on the Pozuelo estate near the bay of Jobos. This is a deep-rooting, vigorous, though rather slender, species and may possibly be of interest in view of its habitat. (Stahl, **3**: 35.)

Styrax portoricensis.

Family Styracaceae; a native forest tree reported from the mountain forests of the eastern part of the island, Luquillo, Naguabo, and Juncos. (Urban, Add. **1**: 53.)

Suelda con suelda. See *Boussingaultia baselloides.*

Sugar. See *Saccharum officinarum.*

Sunn hemp. See note under *Crotalaria retusa.*

Supple Jack. See *Paullinia curassavica.*

Surahwa nut. See *Caryocar nuciferum.*

Suriana maritima. TEMPORANA.

Family Simarubaceae. Reported by Bello.

Susumber. See *Solanum mammosum.*

A Jamaican name for *Solanum mammosum*, used in that island as a stock for grafting the eggplant.

Sweet lemon.

The sweet lemon, or *limon dulce*, is a citrous type very little known and not likely to become popular with the American public, but quite generally cultivated and used in south European countries. No mature specimens of Porto Rican fruit were seen, but the wingless petioles of the leaves and the enormous spines of the vegetative branches render the tree easily distinguishable. The specific identity of this fruit is uncertain. It is, however, quite distinct from the fruit called sweet lemon in Florida.

Sweet orange. See *Citrus aurantium.*

Sweet potato. See *Ipomoea batatas.*

Sweet sop. See *Anona squamosa.*

Sweet william, Barbadoes. See *Quamoclit quamoclit.*

Swietenia mahagoni. MAHOGANY. CAOBA.

Family Meliaceae; the distribution of the true mahogany extends from Florida and the Bahamas to Cuba, Jamaica, Trinidad, and Peru. It is now believed that the mahogany which comes from Mexico and Honduras is the wood of closely allied but distinct species. An oil used as a purgative is said to be extracted from the seeds, and the bark is employed as a tonic. In Cuba this tree is said by Pichardo to yield a gum equal to gum arabic.

It is not known that the mahogany exists at present in the island. Cordova, however, refers to the "caoba" as one of the trees growing in the highlands of Porto Rico.[a]

Grosourdy recommends the replanting of mahogany, leaving 30 or 40 feet (9 to 12 meters) between the trees. These prefer level, rather stony, ground, grow rather quickly, and are usually met with in the low altitudes of the mountains as well as in the lower forests.

Plantations on a large scale prove a source of riches. The tree is of the highest, and the long, straight trunk reaches 2 yards (1.8 meters) or more in diameter. It furnishes a rather light, hard wood that is without doubt very strong. The grain may be coarse or fine, according to the class. In countries where it grows the wood is used in building houses. Specific gravity, 0.819. (Grosourdy, **2**: 370.)

Symplocos lanata. NÍSPERO CIMARRON.

Family Symplocaceae; a native forest tree, 25 to 30 feet (7 to 9 meters) high; from Adjuntas and Penuelas. A related species, *S. micrantha*, is reported from the Sierra de Luquillo and Aybonito. (Urban, Add. **1**: 52.)

Symplocos latifolia. ACEITUNA.

Family Styracaceae; a native forest tree the height of 60 feet (18 meters). Separated by Urban from *Symplocos martinicensis* as understood by Stahl (**6**: 58). Reported from Sierra de Yabucoa, near Aibonito, Adjuntas, Las Marias, Utuado, and Manati.

Symplocos martinicensis. ACEITUNA.

Family Symplocaceae; a shrub or tree native from Cuba to Trinidad. Also called "aceituna cimarrona" and "aceituna blanca." (Urban, Add. **1**: 50; Stahl, **6**: 58.)

Symplocos polyantha. PALO DE CABRA.

A native forest tree, collected by Eggers in the Sierra de Luquillo. (Urban, Add. **1**: 49.)

Synedrella nodiflora. SARBATANA.

An herbaceous annual composite, 50 centimeters high, found in pastures (Stahl, **5**: 143.)

Syzygium jambolanum. JAMBOLIN.

A myrtaceous tree, bearing an edible fruit. It was introduced from the Malay region into Cuba, Haiti, Jamaica, Trinidad, and the French islands, and has frequently escaped from cultivation, but is not known from Porto Rico.

Tabaco. See *Nicotiana tabacum.*

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[a] Cordova, Memorias de la Puerto Rico, **1**: 183, 229.

Tabacon.

A tree from all parts of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood, white, soft; specific gravity, 0.477; used in building houses. (Exp. 1857.) (Grosourdy, **2**: 414.)

Tabacon afelpado. See *Solanum verbascifolium.*

Tabacon áspero. See *Solanum asperum.*

Tabaiba. See *Plumeria alba.*

Tabamuco.

This may be only another way of spelling Tabonuco. It grows to be a large tree, with coarse wood, which is hard to work and very long in drying; generally used for timber, also in constructing road canoes, or "stone boats," for hauling in the hills. It exudes a resinous substance used to make torches. Captain Hansard gives its specific gravity as 0.66.

Tabebuia rigida. ROBLE.

Family Bignoniaceae; a fine tree, 20 meters high, recently described from the Luquillo mountains. (Urban, **1**: 404.)

Tabebuia schumanniana. ROBLE COLORADO.

A species recently discovered near Utuado and claimed by its describer to be one of the most beautiful of the indigenous trees of the island. It attains a height of from 10 to 15 meters and has blood-red flowers about an inch long. (Urban, Symb. **1**: 404.)

Tabeiba. See *Maba sintenisii*, *Plumeria krugii*, and *P. portoricensis.*

Tabernaemontana citrifolia. PEGOGE.

Family Apocynaceae; a wild tree, 3 meters high; grows in the mountains, flowering in the spring. Found in the Antilles and Mexico. Reported from the mountains of Luquillo. (Stahl, **6**: 71.)

Some species of Tabernaemontana have been reported as producing rubber, particularly *T. crassa*, an African tree. It has not been found possible, however, to coagulate the latex into serviceable rubber; it forms instead an extremely sticky gum.

Tabloncillo. See *Dipholis montana.*

A tree from the interior of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 30 to 35 inches (45 to 62 centimeters). Wood, white, hard; specific gravity, 0.837; used in building houses. (Exp. 1857.) (Grosourdy, **2**: 414.)

Tabanuco. See *Dacryodes hexandra.*

A tree from the interior part of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 35 to 40 inches (87 to 100 centimeters). Wood, white, rather hard; specific gravity, 0.671; used for lumber and resin. (Exp. 1857.)

Tachuelo. See *Pictetia aristata*, also note under "tochullo."

A wild tree abundant in the mountains, 40 feet (12 meters) in height, with a trunk reaching 10 or 12 inches (25 or 30 centimeters) in diameter. Furnishes a very hard, yellow wood that is very strong and durable. Used for shingles, fences, shelving, etc. When the tree is old it is burned, the wood becoming so hard as to resist all woodworking tools. (Grosourdy, **2**: 414.)

Tachullo.

A tree from the interior part of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 9 to 10 inches (22 to 25 centimeters). Wood, yellowish, hard; specific gravity, 0.945; used for cabinetwork. (Exp. 1857.)

This is apparently the same as "tachuelo."

Tachulo blanco.

Captain Hansard gives a specific gravity of 1.12 for this wood.

Tafetan. See *Palicourea barbinervis.*

Tagua-tagua. See *Passiflora foetida.*

Talantala. See *Herpetica alata.*

Talantron. See *Casearia bicolor.*

Talauma plumieri. MAGNOLIA.

Family Magnoliaceae; a tree 20 meters high, rarely cultivated in gardens for its fragrant white flowers; native in the French islands. (Stahl, **2:** 21.)

Talaumo.

This appears as a common name in Hill's list of trees of the mountains, and probably conceals a reference to the genus Talauma, a species of which, according to Eggers, furnishes a wood called "sabino." This Talauma turns out, however, to be a Magnolia, and has been described by Urban as *M. splendens.*

Talinum racemosum.

Family Portulacaceae; a coarse fleshy herb, collected by Sintenis at Anasco; our specimens from Rio Piedras were called "verdolaguilla."

Tallote. See *Sechium edule.*

This name is doubtless a local corruption of "tayote," the tendency among the lower classes being to interchange *y* and *ll*, which they pronounce much alike.

Tallow tree. See *Sapium sebiferum.*

Tamarind. See *Tamarindus indica.*

Tamarindillo. See *Chamaecrista glandulosa.*

Tamarindo. See *Tamarindus indica.*

Tamarindus indica. TAMARIND. TAMARINDO.

A large fine-leaved leguminous tree, very common in Porto Rico and widely cultivated in the Tropics for the fleshy edible pods, which have a pleasant, decidedly sour taste, due to the presence of several vegetable acids, including citric and tartaric. According to the Treasury of Botany the tamarinds of the East differ from those of Porto Rico and the other West Indies, in that the pods have a brittle brown shell and contain from 6 to 12 seeds instead of from 1 to 4. Considerable quantities of tamarinds are imported into Europe and America, either dried or preserved in sirup. They are largely used in the preparation of acid cooling drinks, and are believed to have a beneficial laxative effect on the system. To the tamarind are also ascribed numerous other virtues, which have been well summarized in the work mentioned above.

> In addition to their cooling qualities they act as gentle laxatives, and are useful in some forms of sore throat. The pulp mixed with salt is used as a liniment in rheumatism by the Creoles of the Mauritius. The seeds are employed medicinally by the natives of Bengal in dysentery, and they are also used by the Cingalese as food in times of scarcity, the dark outer skin being removed by maceration. Powdered, the seeds are employed as a poultice to boils; this powder also is mixed with thin glue to form a very strong cement for wood. The flowers of the tree are used in Ceylon in cases of liver disease. Medicinal virtues are also ascribed to the leaves, which are used internally in jaundice, and externally as an application to sore eyes or ulcers. An infusion of the leaves is employed to furnish a yellow dye. In Mauritius a decoction of the bark is used in asthma and as a tonic and astringent in dysentery. The timber is valuable for building purposes, and furnishes excellent charcoal for the manufacture of gunpowder. Tamarinds form an important ingredient in Indian cookery, especially in curries; and they are also used in western India in preserving or pickling fish, which under the name of tamarind-fish is considered a delicacy.
>
> It is said that no plants will grow under the shade of the tamarind, hence it is considered unsafe to sleep under the trees. It is also said that the acid moisture they exhale does really affect the cloth of tents, if they are allowed to remain under the trees for any length of time.

The wood is of good weight and more than ordinarily hard. The texture is rather compact and the grain fine. In color it is a dirty white or yellowish. It is not used. Specific gravity, 0. 948. (Grosourdy, **2:** 414.)

Tamonea. CAMACEY.

A large genus of shrubs of the family Melastomaceae. In the National Herbarium, under Miconia, are Porto Rican specimens representing the following species: *Cubensis*, *foveolata*, *fulva*, *guaranensis*, *impetiolaris*, *laevigata*, *prasina*, *rubiginosa*, *sintenisii*, *tetranda*, and *thomasina*.

Tamonea fothergilla. CAMACEY BLANCO.

Family Melastomaceae; a shrub 3 to 4 meters high, in mountain woods. (Stahl, **4**: 100.)

Tamonea impetiolaris. CAMACEY COLORADO.

A shrub 3 to 4 meters high, found in cool, wet places. (Stahl, **4**: 104.)

Tamonea integrifolia. CAMACEY. ALMENDRO.

A shrub 3 to 5 meters high, from the high mountains; bears flowers and fruit at the same time. (Stahl, **4**: 115.)

Tamonea laevigata. CAMACEY DE PALOMA.

A shrub 3 to 4 meters high. in sandy soil over clay. (Stahl, **4**: 106.)

Tamonea racemosa. CAMACEY RACEMOSO.

A shrub 3 meters high, in waste places. (Stahl, **4**: 110.)

Tamonea thomasiana. CAMACEY. TOMASO.

A shrub 3 meters high, in waste places. (Stahl, **4**: 108.)

Tapa-camino. See *Vernonia arborescens.*

Tapioca. See *Manihot.*

The name tapioca is used with us only for the shot-like preparation of cassava starch, but it is also applied in Brazil and other countries to the starch in the granular form and even to the roots or to the whole plant.

Tarantala. See *Herpetica alata.*

This is evidently intended for the same as "talantala."

Taro. See *Colocasia esculenta.*

The better known Polynesian name for the plant called "yautia" in Porto Rico.

Tartago. See *Jatropha curcas.*

A tree from all parts of the island; height, 12 to 15 feet (3.5 to 4.5 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood white, soft; specific gravity 0.317; used in medicine. (Exp. 1857.)

Tayote. See *Sechium edule.*

Té. See *Capraria biflora.*

Té del pais. See *Capraria biflora.*

Tea.

Successful experiments have been made in Jamaica, and there appears to be no reason why tea could not be grown on the mountains of Porto Rico.

Téa. See *Amyris maritima* and *A. silvatica.*

A tree from the northeastern part of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 5 to 6 inches (12 to 15 centimeters). Wood white, soft; specific gravity 1.208; used for torches. Also called "teo." (Exp. 1857.)

Tea, Spanish. *See Pentarhaphia longiflora.*

Tecoma barterii. ROBLE PRIETO.

Family Bignoniaceae; a wild tree 5 meters high, usually found along the coast. Flowers in May. (Stahl, **6**: 176.)

Tecoma haemantha.

An indigenous shrub or tree attaining a height of 10 meters, with large purple or red flowers. Known from the vicinity of Coamo, Peñuelas, Utuado, Maricao, Sabana Grande, and Mayaguez.

Tecoma leucoxylon.

A shrubby, erect species with small leathery leaves. Grows near the sea, on the south side of the island; Guanica and Ponce. (Sintenis.)

Tecoma pentaphylla. ROBLE BLANCO.

A wild tree 10 meters high, wood white and strong. Common to all parts of the island and occurring in all the Antilles. Said by Stahl to flower in May, but our specimens collected in the Plata Valley above Cayey had handsome pink flowers in November. (Stahl, 6: 175.)

Tecoma stans. ROBLE AMARILLO.

A tree 4 meters high, cultivated in gardens for its yellow flowers. (Stahl, 6: 278.)

Tecomaria capensis.

Family Bignoniaceae; a climber, native of the Cape of Good Hope. Cultivated at Ponce.

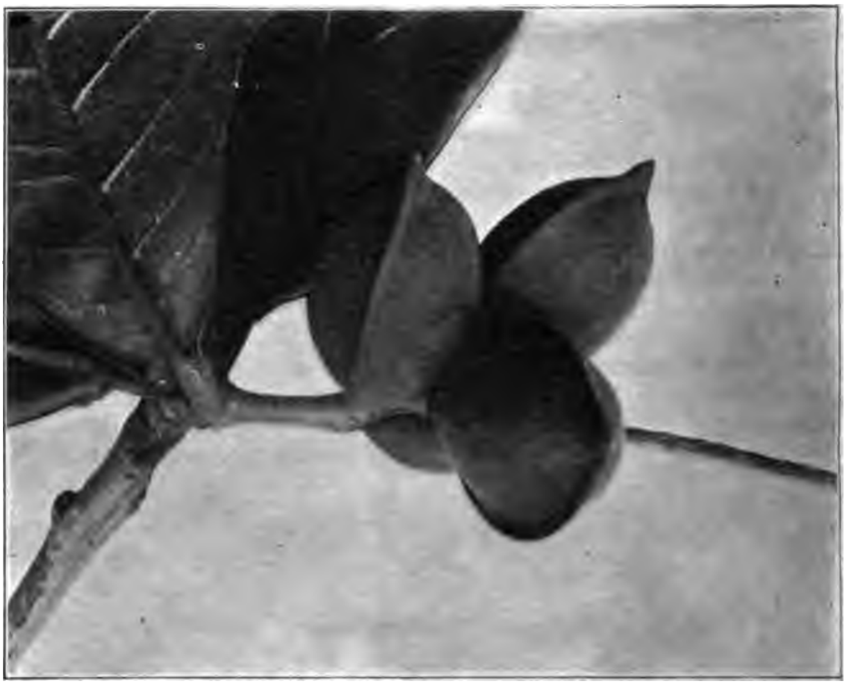


FIG. 13.—Almendra, fruit of *Terminalia catappa*.

Temporana. See *Suriana maritima.*

Teo.

Probably the same as téa.

Tephrosia. See *Cracca.*

Toramnus uncinatus. CRESTA DE GALLO BLANCO.

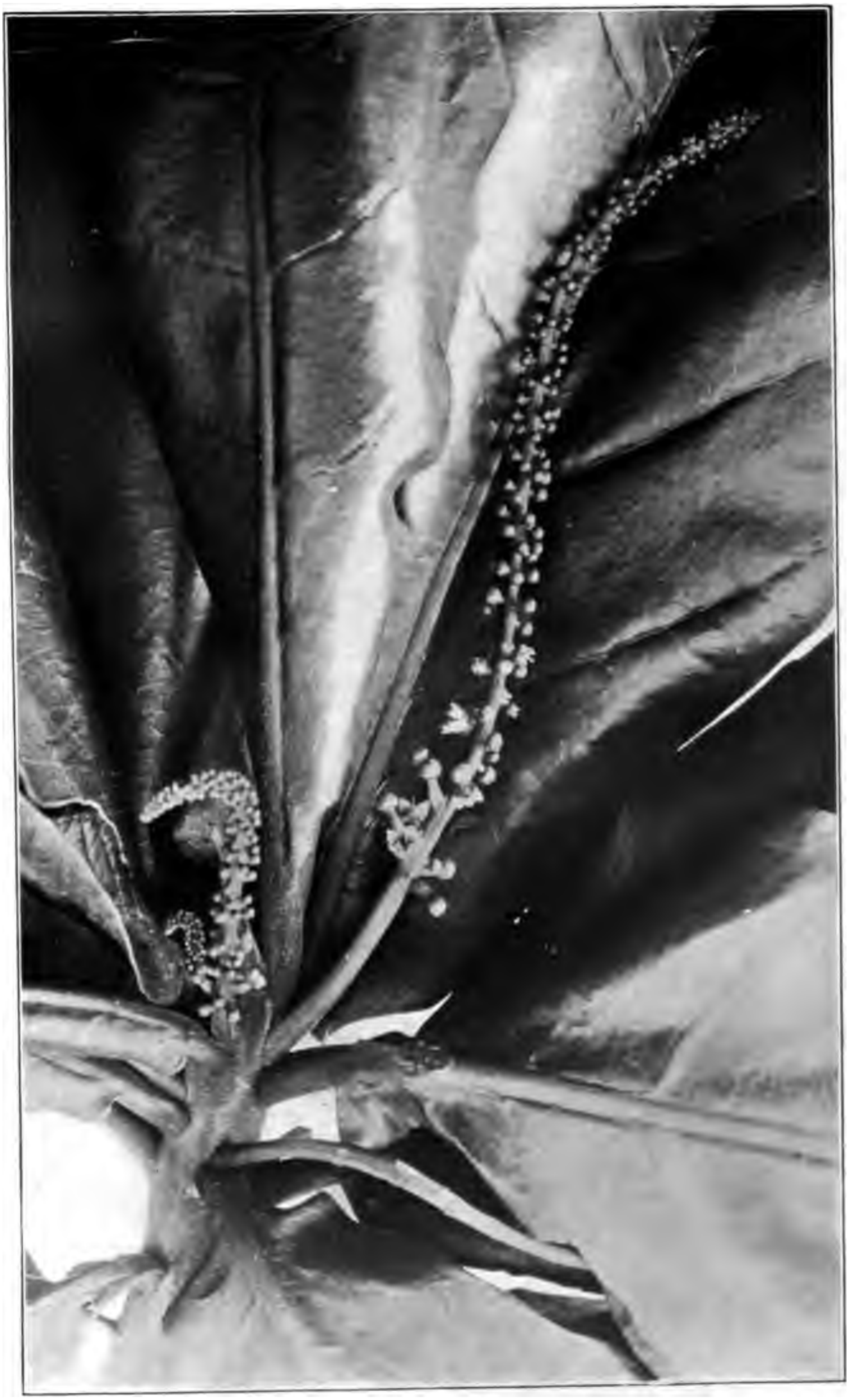
Family Viciaceae; a vine with twining branches. (Stahl, 3: 64.)

Terminalia bucoras. See *Bucida buceras.*

Terminalia catappa. ALMENDRO. INDIAN ALMOND.

PLATE LVII and FIGURE 13.

This is the large beautiful large-leaved tree so commonly planted for shade at San Juan and along the military roads, and called "almendro." It is believed by many Porto Ricans to be the genuine almond tree on account of the close



ALMENDRO (TERMINALIA CATAPPA).

similarity of the nuts. It is scarcely necessary to add that the almond is a close relative of and very similar to the peach, while the Porto Rican "almendro" is a member of the tropical family Combretaceae, to which belongs the "mangle blanco," or white mangrove, *Laguncularia racemosa*, forming a large part of the mangrove swamps behind Cataño and probably elsewhere in Porto Rico. The present species is, however, a native of the East Indies, though widely known in the Tropics.

While similar in shape and texture to almonds the nuts of Terminalia have not the characteristic flavor, though generally considered quite palatable. There seems to be no published account of experiments with their keeping qualities or of other efforts at placing them upon the market. We saw none in the dried condition, but while green the somewhat fleshy husk shows no tendency to separate from the shell of the nut proper. As with other species of Terminalia a black dye may be obtained from the bark and leaves of the tree. A silkworm is also raised upon the leaves in India. The fruits of other species are also astringent and have a place in commerce among dyestuffs under the name "myrobalans."

A photograph of Terminalia has been published in Mr. Wilson's paper (Pl. V) over the title " Bent mango trees, San Juan."

Grosourdy (**2**: 360) states that the wood is brownish with a specific gravity of 0.699 and has no use. He gives the name Almendro de Indias.

Ternstroemia elliptica. See *Ternstroemia stahlii.*

Ternstroemia heptasepala.

A specimen is in the National Herbarium from the Sierra de Luquillo.

Ternstroemia luquillensis. PALO COLORADO.

A tree 6 to 20 meters in height, known only from the Luquillo region. This is also true of *T. heptasepala*, a smaller tree or shrub of 2 to 8 meters.

Ternstroemia stahlii. MAMEY DEL CURA.

A small tree of 12 to 15 feet (3.5 to 4.5 meters) common in thickets in sandy soil near the sea, in the vicinity of Bayamon. *T. peduncularis stenophylla*, from Fajardo, and *T. pachyphylla*, from El Yunque, are related species without local names yet reported. *T. elliptica*, of Stahl's Flora, is a synonym of *T. stahlii.*

Teta de burro. See *Hirtella triandra* and *H. rugosa;* also *Chrysophyllum monopyrenum.*

Teta de curra.

A tree from all parts of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 8 to 10 inches (20 to 25 centimeters); wood pinkish, hard; specific gravity, 0.816; not used. (Exp. 1857.)

Tetragastris balsamifera. MASA.

Family Burseraceae. A common forest tree, 10 meters high, yielding balsam. (Stahl, **4**: 50.)

Grosourdy gives this species the name Tabanuco and describes it as a wild tree growing in the center of the Antilles, reaching 45 to 60 feet (13 to 18 meters) in height, with a long straight trunk 5 hands ("cuartas") in diameter, more or less. From the cracks in the bark and cuts made for this purpose exudes a white, very aromatic resin. The wood is rather light, moderately hard, fibrous in texture, with a rather fine grain, rose-colored or gray tinged with a light flesh color and yellow. It is rather strong, resistant, and much appreciated because of its beauty and durability. It is also free from the attacks of insects, because of the resin which it contains. It is used for the interior work of houses and other fine carpenter work. (Grosourdy, **2**: 363.)

Tetrapteris citrifolia. BEJUCO DE PARALEJO.

Family Malpighiaceae; a high, trailing climber.

Tetrapteris paniculata. BEJUCO DE PARALEJO.

A vine-like biennial shrub; grows in various parts of the island. (Stahl, **2:** 151.)

Tetrazygia elaeagnoides. CENIZO.

Family Melastomaceae; a much-branched shrub 4 to 5 meters high, frequenting limestone hills. Bello calls this "verdeseco." (Stahl, **4:** 3.)

Tetrazygia stahlii. CENIZO.

A shrub 3 meters high, with cinnamon bark, grows on rocks at an elevation of 1,500 feet. (Stahl, **4:** 113.)

Thalia geniculata.

Family Marantaceae: has very large, abruptly ovate, closely veined leaves and peculiar zigzag flower stalks; known from Añasco. (Sintenis.)

Theobroma cacao. CACAO.

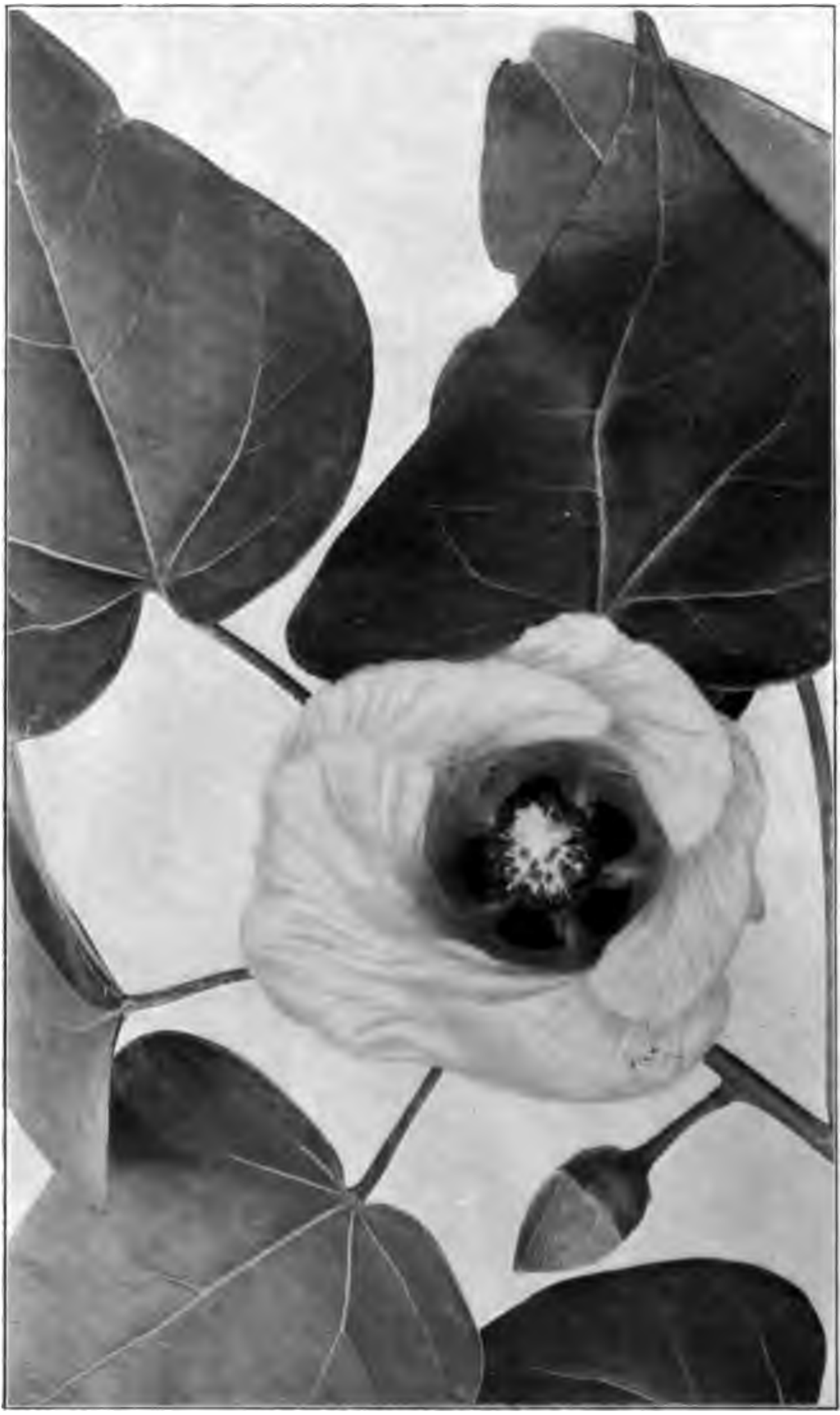
The cultivation of cacao is becoming one of the major industries of the Tropics, and as such is reasonably safe from the commercial side, although market prices will undoubtedly be subject to fluctuation, as with all staple articles. A great objection to the extensive cultivation of cacao in Porto Rico is the danger of wind storms, which may shake the entire crop from the trees. Cacao is unusually susceptible to this danger, since the large fruits are borne on very slender stems which come directly out of the inflexible wood of the larger branches or even from the trunk itself.

Cacao was introduced into Porto Rico by refugees from Venezuela in the early part of the century, and the culture flourished for a considerable period, although the amount produced was never very large and has of late years declined, perhaps owing to the fact that the exports of other countries were more prominent in the markets and had easier access to the commerce of Europe and the United States. In some of the West Indian islands, not subject to hurricanes, cacao is, however, already recognized as an important product. In many parts of the island of Porto Rico it might be made a valuable adjunct to mixed farming. The processes are not complicated nor costly, but some skill is required, and a mistake may render the beans of little or no value.

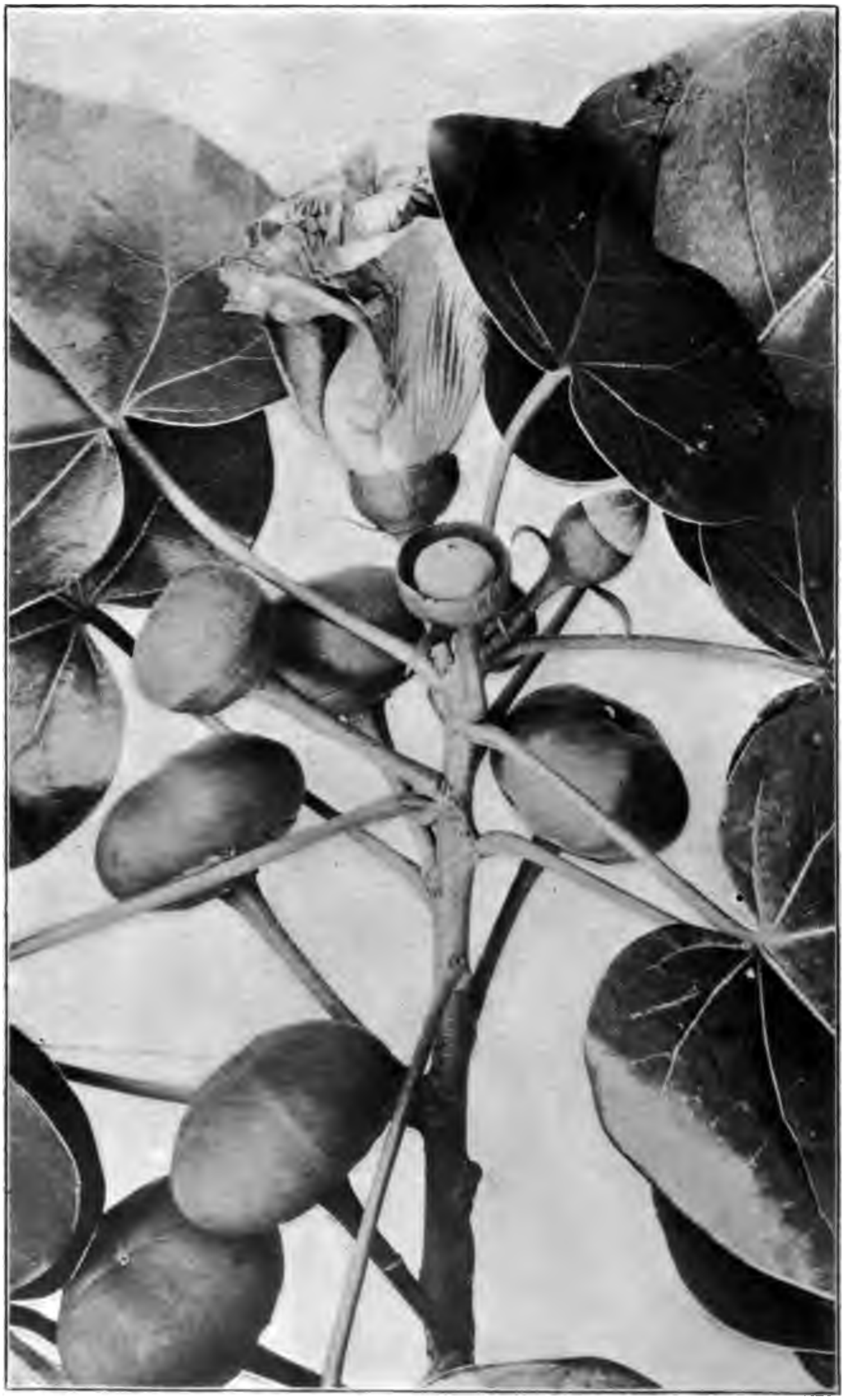
A new cacao disease has recently appeared in Trinidad which forbids the importation into Porto Rico of new stock from that island without expert precautions or quarantining in a locality where no cacao trees now exist, so that plants which proved to be infected might be carefully destroyed before the disease could spread.

Superintendent Hart of the Royal Botanic Gardens of Trinidad secured some years since from Nicaragua a species of cacao (*Theobroma pentagona*) not previously cultivated in that island. Trees of this species have recently fruited and are found to be more vigorous and resistant to disease than the varieties of *Theobroma cacao* hitherto used. The fruits of *T. pentagona* differ from those of *T. cacao* in having five prominent ridges or angles. In Nicaragua it is said to yield beans of high grade for manufacturing purposes. Successful attempts at grafting cacao by the method of inarching have also been made at the Trinidad Gardens, an achievement of vast importance to this industry, since it renders possible the formation of plantations of trees of uniformly high vigor and productiveness, which will yield a product of uniform quality, able on that account to command special prices in the market.

The best cacao of Mexico from the region of Socomusco in the State of Chiapas does not come from *T. cacao*, but is believed to be derived from *T. angustifolia*, a very different species, now placed in a distinct subgenus. Several other species are also cultivated in Central and South America, and those doubtless have more or less different requirements in the way of climate and soils. A careful canvass of the subject would be logically the first step in the direction of reestablishing a cacao industry in Porto Rico.



SANTA MARIA (THESPESIA POPULNEA). NEAR PONCE.



SANTA MARIA (THESPESIA POPULNEA), SHOWING FRUIT.

The area well adapted to cacao culture in Porto Rico is relatively small, since thoroughly tropical conditions are necessary, including moisture, warmth, and an elevation under 500 feet. Moreover, exposure to sea breezes is also detrimental, so that the suitable situations are mostly restricted to the more sheltered valleys and the region of the foothills. Partial shade is also considered desirable, but as in the case of coffee the happy effects may prove to be due to the prevention of drought and to the maintenance of the fertility of the soil by the "madres de cacao" or "mothers of cacao," as the trees of *Erythrina umbrosa* are commonly called in South America. It is certain, at least, that the tree thrives and the foliage remains entirely uninjured in the open sun at sea level, particularly when judicious pruning encourages the growth of lateral branches to shade the trunk of the tree and the ground underneath. The use of the Para rubber tree Hevea and also of Castilloa for shade of cacao plantations has been suggested, but it is not known that this plan has been found successful in practice.

To open a plantation of cacao is more difficult than to start one of coffee, since the young seedlings are much more delicate and seldom survive transplanting by the methods followed with coffee. In some countries the seed is planted in small baskets which can be buried in the ground without disturbing the seedlings. A second, but less desirable plan, is to sow the seeds in the place where the tree is to grow. In both cases it is considered wise to dig large holes 2 feet square and 2 feet deep, which are allowed to remain open for a month or two before planting. The fine earth and vegetable débris which collects in the holes and the surface soil which should be used in filling them up provide the young plants with conditions favorable for vigorous growth. In direct seeding three or four plants are sprouted in each hole, all but the strongest being afterwards removed. Baskets suitable for cacao plants can be made very inexpensively in most tropical countries, but flowerpots have also been advised where these are obtainable at a cheap rate, or where they can be manufactured readily. In Porto Rico the local potteries would undoubtedly be able to supply ample quantities at low prices. Twelve feet seems to be the preferable distance between the trees, which are permitted to reach no more than equal height, although in nature or where crowded with other vegetation they sometimes run up to 20 or 30 feet. While cacao is young other crops, such as bananas, indian corn, and sweet potatoes, are planted between the rows to give partial shade and assist in keeping the ground clear of weeds.

Thespesia grandiflora. MAGAR.

Family Malvaceae; a wild tree, 10 to 15 meters high, occurring in all parts of the island; the large red flowers are produced all the year. Wood excellent for furniture. The species appears to be peculiar to Porto Rico. Beautiful trees said to be "magar" were pointed out to us between Manati and Arecibo. (Stahl, 2: 97.)

A wild tree not very abundant that should be planted for ornament as well as for its useful wood. The tree is 50 feet (15 meters) high and the straight, rather long trunk reaches the diameter of 30 inches (75 centimeters). The wood is rose-colored when fresh, black when old. It is strong and breaks with a vertical fracture. Its common use is for shelving. It is used also for making flutes, pegs of guitars, and other work of this class; also for furniture. Placed in the earth it lasts for a long time and is considered the best wood for foundations. Specific gravity, 0.677. (Grosourdy, 2: 397. The native name is here spelled "maga.")

Thespesia populnea. SANTA MARIA. PALO DE JAQUECA. PLATES LVIII, LIX.

A wild tree 3 to 5 meters high, found by Stahl near the central part of the northern coast. Flowers all the year. The uses are similar to those of "emajagua." Several of these are detailed in the Treasury of Botany:

"*T. populnea*, the best known species, is an extremely common tree on the seashores of most eastern tropical countries, and also in western Africa, the West Indies, South America, and the Pacific islands. It forms a tree 40 or 50 feet (12 or 15 meters) high, and has a dense head of foliage, on account of which it is called the umbrella tree in some countries, and is planted in many tropical districts for the sake of its shade and for forming avenues. Its leaves are large, roundish, heart-shaped, and pointed; and its flowers, which like those of many mallowworts are large and showy, are at first yellow with a purple central spot, but change altogether to purple before they die off in the evening. Several parts of the tree are applied to useful purposes. The inner bark of the young branches yields a tough fiber, fit for cordage, and used in Demerara for making coffee bags, and the finer pieces of it for cigar envelopes. The wood is considered almost indestructible under water, and is therefore used for boat building; besides which its hardness and durability render it valuable for cabinetmaking and building purposes, while in Ceylon it is employed for gunstocks. The flower buds and unripe fruits yield a viscid, yellow juice, useful as a dye, and a thick deep red colored oil is expressed from the seeds."

The name "Santa Maria" was used near Ponce.

Thevetia neriifolia. CABALONGA.

Family Apocynaceae; a shrub, 3 meters high, but green throughout. The flowers are large and saffron-colored, causing it to be cultivated for an ornamental. The milky juice is said to be a dangerous poison; also the fruits, while the bark has been used as a febrifuge. (Stahl, **6**: 68.)

A small tree, 10 to 20 feet (3 to 6 meters) high, rather dense, with a trunk about 6 feet (1.8 meters) long, 5 to 6 inches in diameter. The wood is not hard, rather light, fibrous in texture, with a rather fine grain. Specific gravity, 0.813. (Grosourdy, **2**: 367.)

Thibaudia portoricensis.

Family Ericaceae; known from Sierra de Luquillo. This genus contains several ornamental shrubs, some of which have been introduced to hothouse cultivation.

Thouinia portoricensis. SERRA-SUELA.

A sapindaceous shrub of 3 to 5 meters; Yauco, Guanica, Cabo Rojo; called also "quiebra hacha," "quebracho," and "ax breaker." This species *T. striata* has very hard wood.

Thouinia striata. SEBUROQUILLO.

An indigenous tree, 8 to 20 meters high. Reported from numerous localities on both sides of the island. (Urban, Symb. **1**: 349.)

Thouinia tomentosa. CEBORUQUILLO.

A tree, 5 to 8 meters high, growing on hills. Flowers in April and May. Bello gives the the common name "quebra hachas" or "ax breaker," which doubtless alludes to the very hard wood. (Stahl, **2**: 158.)

Thringis laxa. YARAY.

Family Sabalaceae; a small slender fan palm said to be used in the neighborhood of Vega Baja for the manufacture of hats and other articles in the same way that *Inodes causiarum* is employed farther west.

Thuja occidontalis. ARBOR VITAE.

Though a native of northern latitudes this species seems to thrive in the Tropics, while never attaining large size. It is occasionally planted for hedges and as an ornamental in Porto Rico, and a specimen from Jayuya is in the National Herbarium.

Thunbergia alata.

Family Acanthaceae; an ornamental vine introduced from India. This has now escaped from cultivation in Porto Rico and is almost as common as Momordica ("cundeamor"). (Stahl, **6**: 253.)

There are two forms, one having the expanded part of flowers white or very pale lavender, the other cream yellow, but both have the throat of the corolla deep purplish. At Santurce this was called "bejuco de puerco."

Thunbergia erecta.

From Yabucoa, cultivated in gardens. Our specimen (no. 359) is from Caguitas and was called "buenoces," or something of similar sound.

Tibey.

As will be seen below, this name is applied to several herbaceous plants of different families, so that it is not evident to which applies the following statement by Hill:

"A small herb called the tibey, the flower of which resembles the lobelia, grows in the meadows and pastures of the island. Its poison is said to be so active that a horse or other animal eating of it dies in a short time. The natural instinct of the animal teaches it to avoid this dangerous plant as soon as the odor reaches him."

Tibey amarillo. See *Rhytidophyllum stipulare.*

Tibey blanco. See *Isotoma longiflora.*

Tibey de cresta. See *Alloplectus cristatus.*

Tibey parasito. See *Columnea hispida.*

Tibey-Tupa. See *Lobelia acuminata.*

Tillandsia.

A large genus belonging to the Bromeliaceae or Pineapple family. It includes the Spanish or Florida moss of our Southern States and numerous Porto Rican species, most of which resemble small pineapple plants and are called pinuelas. Two of the more common species in Porto Rico are *T. fasciculata* and *T. recurvata*, the latter abundant everywhere on the south side of the island, and by reason of its small size resembling tufts of "Florida moss," *Tillandsia usneoides*, which was not seen.

Tintillo. See *Randia aculeata.*

Tobacco. See *Nicotiana tabacum.*

Tomate. See *Lycopersicon humboldtii.*

Tomate amarillo. See *Lycopersicon cerasiforme.*

Tomate grande. See *Lycopersicon lycopersicum.*

Tomato. See *Lycopersicon lycopersicum.*

Torchwood. See *Amyris elemifera.*

A name used in Florida and the Bahamas. In Porto Rico torches are also said to be made from tabanuco, supposed to be *Dacryodes hexandra.*

Toro.

A tree from the eastern part of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood red, rather hard; specific gravity, 0.845; used in building houses. (Exp. 1857.) (Grosourdy, **2**: 416.)

Toronja. See *Citrus decumana* and *C. medica.*

The Spanish name of the true citron and the shaddock.

In Porto Rico this name is applied not only to the pomelo, but to several other citron-like fruits, varieties of *C. medica.*

Tortera.

In the market of Ponce large brown sea beans, said to be good for piles, were being sold by an herb dealer at 15 centavos apiece. By placing in water in a cocoanut shell a pair of beans are selected, called male and female, the female sinking and the male floating. Drink the water and then carry the two beans about in the pocket. A similar charm is exerted by a combination of a red bean, "mato colorado," with a gray or white bean, "mato amarillo," of *Caesalpinia bonducella.*

Tortuguillo. See *Antirrhoea obtusifolia.*

Enumerated by Hill among forest trees yielding timber and fuel.

Tortuguillo amarillo.

A tree from all parts of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood yellowish, hard; specific gravity, 0.806; used for cabinetwork. (Exp. 1857.)

At Yauco a light-colored, fragrant wood. Also called "bartolillo" and "aceitillo." The best comes from the vicinity of Guanica.

Tortuguillo blanco.

A tree from all parts of the island; height, 20 to 25 feet (6 to 8 meters); diameter, 12 to 15 inches (30 to 37 centimeters). Wood white, hard; specific gravity, 0.814; used for cabinetwork. (Exp. 1857.)

At Yauco thought to be the same as "bartolillo."

Tortugo.

Perhaps the same as "tortuguillo." Captain Hansard gives a specific gravity of 1.25 for this wood.

Tortugo alba.

A tree from the eastern part of the island; height, 50 to 60 feet (15 to 18 meters); diameter, 20 to 25 inches (50 to 62 centimeters). Wood yellowish, hard; specific gravity, 0.894; used for cabinetwork. (Exp. 1857.)

Apparently the same as "tortugo blanco."

Tortugo blanco.

An abundant wild tree, 50 to 60 feet (15 to 18 meters) high, with a trunk 24 inches in diameter. Furnishes a yellow wood, commonly used for shelving and the framework of rude houses. (Grosourdy, **2**: 416.)

Tortugo amarillo. See *Sideroxylon mastichodendron.*

Said by Grosourdy to be a variety of tortuga blanca. It grows to the same dimensions and in the same localities, and differs only in having a compact wood deep yellow in color. It is very strong, and is used in the manufacture of very fine furniture. (Grosourdy, **2**: 416.) Specific gravity, 1.051. (Exp. 1857).

Tortugo prieto. See *Ravenia urbana.*

Tostado. See *Homalium racemosum.*

Toston. See *Boerhavia erecta.*

Totumo. See *Crescentia cujete.*

The name "totumo" is given by Hill, but seems to be uncommon in Porto Rico; it is known, however, from Cuba, but "güira" and "güira cimarrona" appear to be principally used, even there. Hill also gives "hachuelo" and "tachuelo" in connection with this species, but this is certainly erroneous. "Hachuelo" seems to be entirely unknown, suggesting only hatchet (hachuelo) to the Porto Ricans. Tachuelo is a leguminous tree, as appears elsewhere.

Touola. See *Maranta arundinacea.*

Tournefortia bicolor.

Family Boraginaceae; a shrub about 6 feet (1.8 meters) high, with greenish-white flowers growing in thickets. Known from Lares.

Tournefortia footidissima. NIGUA FETIDA.

A shrub, 5 meters high. In cool, shady places of the mountains. Common to all the Antilles. (Stahl, **6**: 102.)

Tournefortia gnaphalodes. NIGUA DE PLAYA.

A shrub 1 meter high, found on coastal plains. (Stahl, **6**: 100.)

Tournefortia hirsutissima. NIGUA PELUDA.

A reclining shrub, 1 to 3 meters. In hedges and waste places. At Juana Mata, near Ponce, this species was called simply "nigua," while Bello writes "mata de niguas."

Tournefortia laevigata. NIGÜITA.

A shrub 2 meters high, found on steep cliffs. (Stahl, **6**: 103.)

Tournefortia laurifolia. NIGUA-HOJA-LAUREL.

A woody biennial 2 meters high, found in waste places and at the base of mountains. Known from Coamo. (Stahl, **6**: 105.)

Tournefortia volubilis. NIGUA ENREDADERA.

A woody twiner 3 meters high, grows in waste places, running over trees and shrubs. Known from Salinas de Cabo Rojo. (Stahl, **6**: 104.)

Tovomita elliptica. MARIALVA ELIPTICA.

Family Clusiaceae; a much-branched shrub 2 meters high, found on the north coast from Loiza to Manati. (Stahl, **2**: 126.)

Tradescantia discolor. See *Rhoeo discolor.*

Tragia volubilis. PRINGAMOSA.

A euphorbiaceous vine collected at Guayama (no. 539) and at Vega Baja (no. 1024). The leaves and stems are beset with poisonous hairs, which cause a burning sensation and raise blisters.

Tree fern.

Three genera of tree ferns were reported by Eggers—Cyathea, Serra, and Alsophila—but without reference to species.

Tree tomato. See *Cyphomandra betacea.*

Trema lamarkiana.

A tree or shrub known from Sabana Grande. The Index Kewensis places this genus under the Urticaceae, while Engler assigns it to the Ulmaceae.

Trescabezas. See *Cephaelis triplocephala.*

Tribulus cistoides. ABROJO.

Family Zygophyllaceae; found near Guanica by Bello. A perennial herb common to seashores of all continents. Said to be cultivated for its flowers in Jamaica. (Stahl, **2**: 173.)

Tribulus maximus. ABROJO.

A fleshy herb, 50 centimeters high, found in sandy places near the sea, said to be gathered in Jamaica for fodder. (Stahl, **2**: 172.)

Trichilia diversifolia. CABO DE HACHA.

Family Meliaceae; a tree of medium size in mountain woods. (Grisebach.) (Stahl, **2**: 166, as *Photacilia diversifolia.*)

Trichilia havanensis. GUARAGUAO CIMARRON.

A specimen believed to represent this species was obtained near Toa Alta from a bush 8 to 10 feet (2.5 to 3 meters) high.

Trichilia hirta. CABO DE HACHA.

A forest shrub, 5 meters high, known from Guayama and Aguada. Specimens were collected at Coamo Springs, with the common name "guayavacan." (Stahl, **2**: 165.)

Trichilia pallida.

Known from Adjuntas, Luquillo, and Yabucoa. (Sintenis.)

Trichilia simplicifolia. Cabo de hacha.

(Stahl. 2: 166, as *Photacilia diversifolia.*)

Trichilia spondiodes. Guaraguao.

A large dense tree 60 feet (18 meters) high with a long, straight trunk 6 to 6½ inches (15 to 16 centimeters) in diameter. It furnishes a wood that is neither very heavy nor very hard. This wood is much appreciated and was used by the military authorities of San Juan in the construction of heavy carts and for similar works; it is also made into boards, canoes, boats, and farm implements. (Grosourdy, 2: 368.)

Trichilia triacantha.

A recently described tree of 5 to 10 meters, known from limestone mountains about Peñuelas and Guanica. (Urban, Symb. 1: 329.)

This species has most peculiar cuneate leaves, with the midribs and lateral corners produced into long, sharp spines. The texture and congested subdigitate arrangement of the leaves are also entirely different from that of the species of Trichilia and leave no doubt that Urban's new section Acanthotrichilia should be looked upon as a new generic type peculiar to Porto Rico. The present species would probably make in cultivation a neat, handsome shrub. It is evidently adapted to a dry climate.

Trinitaria. See *Bougainvillea spectabilis.*

Triopteris inaequalis. Bejuco de paralejo.

Family Malpighiaceae; a vine found in waste places. (Stahl, 2: 150.)

Triopteris rigida. Bejuco de paralejo.

Stahl regards this as a doubtful species. (Stahl, 2: 150.)

Triphasia aurantiola.

Family Rutaceae; a shrub cultivated for its sweet fruit.

Triumfetta althaeoides. Cadillo altea.

Family Tiliaceae; a woody, herbaceous annual, 60 centimeters high, common to all parts of the island. (Stahl. 2: 113.)

Triumfetta lappula.

A woody herb, 2 to 5 feet (60 to 150 centimeters) high.

Triumfetta semitriloba. Cadillo altea.

A woody herb, 4 to 6 feet (120 to 180 centimeters) high, common to all tropical countries. The bark is tough and strong, affording a fiber which has been used for ropes.

Trophis americana.

Family Moraceae; a low tree from Utuado.

Trumpet tree. See *Cecropia peltata.*

Tulipa. See *Schlegelia brachyantha portoricensis.*

Tulip tree. See *Paritium elatum.*

Tuna brava. See *Opuntia tuna.*

Tuna mansa. See *Nopalea coccinellifera.*

Tupa acuminata. See *Lobelia acuminata.*

Tupa assurgens. See *Lobelia assurgens.*

Turkey berry. See *Solanum torvum* and *S. mammosum.*

Turma toro. See *Eupatorium macrophyllum.*

Turmeric. See *Curcuma longa.*

Turnera pumilea. Mari-Lopez.

Family Turneraceae; a much-branched annual herb, occurring in sand on the north side of the island. (Stahl, 4: 160.)

Turnera ulmifolia. MARI-LOPEZ.

A much-branched, erect, woody shrub, 50 centimeters high, growing in the sand. (Stahl, **4**:159.)

Turpinia occidentalis.

Family Staphyleaceae; a tree 3 to 5 meters high, occurring in waste places; flowers in summer. Secured by Sintenis from the vicinity of Adjuntas. (Stahl, **4**: 24.)

Turpinia paniculata. AVISPILLO.

A shrub 3 to 5 meters high; flowers in summer. The common name is reported by Bello. (Stahl, **4**: 23.)

Typha domingensis. CAT-TAIL.

A familiar object in waste places is this West Indian cat-tail, different botanically from our northern species, but appearing quite the same in nature.

Ucar. See *Bucida buceras.*

Ucare.

Given by Hill as a variation of "ucar."

Ucare blanco.

The wood is described as follows:

> Color, light ashy brown. Minute ducts very numerous, occurring singly and evenly diffused between the medullary rays. Medullary rays minute, very numerous, wavy, distinct. Wood fibers strongly interlaced. Remotely resembling fine-grained heartwood of American elm. (Hill and Sudworth.)

Ucare negro.

The wood is described as follows:

> Color, dark umber-brown. Conspicuous ducts occurring singly and evenly scattered between the medullary rays; the latter minute, distinct. Wood fibers interlaced, but appearing to be straight-grained. Remotely resembles a very fine-grained black walnut. (Hill and Sudworth.)

Uña de gato. See *Martynia diandra*, *Pisonia aculeata*, and *Pithecolobium unguis-cati.*

Uniola racemiflora.

A grass from Salinas de Cabo Rojo. A species of Uniola, growing on the shores of the Gulf of California, having considerable economic importance as a cereal.

Uragoga grosourdyana. See *Psychotria pendula.*

Uragoga portoricensis. See note under *Psychotria pendula.*

Urena lobata. CADILLO.

Family Malvaceae; a shrubby annual 1 meter high; common to all parts of the island. (Stahl, **2**: 79.)

Urena sinuata. CADILLO PATA DE PERRO.

A shrubby annual 1 meter high; found in all parts of the island. (Stahl, **2**: 81.)

Urera chlorocarpa.

Family Urticaceae; a shrub from Adjuntas.

Utricularia subulata. BLADDERWORT. GRASILLA.

Family Pinguiculaceae; a delicate aquatic herb. (Stahl, **6**: 256.)

Urban has recently identified *Utricularia gibba* from Fajardo and *U. spirandra* from Manati.

Uva. See *Vitis vinifera.*

Uva del mar. See *Coccolobis uvifera.*

Uva de playa.

No. 84.

Uverillo. See *Coccolobis laurifolia.*

Uvero. See *Coccolobis uvifera.*

A tree from the coast: height, 20 to 25 feet (6 to 8 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood pinkish, soft: specific gravity, 0.864; not used. (Exp. 1857.)

Uvillo. See *Coccolobis laurifolia* and *C. obtusifolia.*

A tree from the coast; height, 12 to 15 feet (3.5 to 4.5 meters); diameter, 8 to 10 inches (20 to 25 centimeters.) Wood, dark, rather hard; specific gravity, 0.964; used in making furniture. (Exp. 1857.)

Valerianodes. VERBENA.

A genus of Verbenaceae including several herbs reported from Porto Rico under the generic names Stachytarpha and Stachytarpheta. Stahl describes three species, *jamaicense*, *cayennense*, and *strigosa.* (6: 205–207.)

Bello gives the name *bretonica* for *Stachytarpha jamaicensis.*

Valerianodes dichotomum. VERBENA DE JAMAICA.

A woody herb, 50 centimeters high; common to all parts of the island. (Stahl, 6: 205, as *Stachytarpheta dichotoma.*)

Valerianodes strigosum. VERBENA BLANCA.

An herbaceous annual found along the coast, 50 centimeters high. (Stahl, 6: 207, as *Stachytarpheta strigosa.*)

Vanilla planifolia. VANILLA.

The "vanilla beans" of commerce are the pods of orchids of the genus Vanilla. Several species have been planted on a small scale or harvested in the wild state, but *Vanilla planifolia*, a native of Mexico and Central America, is the only species in general cultivation. Vanilla was used by the Aztecs and is still employed in Mexico for flavoring chocolate, but since its introduction to Europe in the sixteenth century it has been applied to many other purposes, and a large annual production is now required to supply the demand. Although Mexico is the original home of the plant, and still produces, in the State of Oaxaca, the highest quality of commercial vanilla, the cultural industry has received its greatest development in the islands of the Indian and Pacific oceans, particularly in the French islands of Réunion and Tahiti. Nowhere in the East has it proved possible, however, to equal the quality of the Mexican product. Recent quotations show $15 per pound for the Mexican pods against $3.50 for Tahiti, a difference which seems to indicate that the natural conditions are not advantageous, the methods of cultivation bad, or the variety inferior. If experiments are to be undertaken in Porto Rico, no pains should be spared to secure correct propagating stock, together with a knowledge of the conditions and processes required for the production of the best grade of Mexican vanilla. Although stated to be a parasite by so competent an authority as Semler, vanilla is in reality merely an epiphyte or air-plant able to elaborate its food directly from the atmosphere. If a piece of the vine be hung up in a favorable situation, it will not die, but will continue to grow. However, the plant is not completely epiphyte, and if tied to the trunk of a tree, will send down roots to the ground in addition to others with which it clings to the bark. The character of the soil is therefore of relatively little importance in vanilla culture, the temperature and humidity being the chief factors. The extreme equability of the climate of Porto Rico is admitted by all, and is one of the points most insisted upon for this culture. In the matter of humidity the greatest variety of conditions can be found in Porto Rico, and there is every probability that favorable situations can be found. Too great humidity is not desirable and injures the aroma.

In Mexico the Gulf region about Vera Cruz is more moist than the Pacific slope of Oaxaca, whence the best vanilla comes, and the East Indian and the Pacific islands where vanilla culture has been carried on have all a much more moist climate than Mexico. A climate in which rain falls during the entire year is not, however, desirable, since comparatively dry weather is necessary to check the growth of the vines and cause them to flower. In the Seychelles two months of dry weather are usual, but in Mexico four or five months are the rule. During this time the vanilla plantations are, however, kept moist by the shade under which the vines are at all times planted and by the surrounding growth of dense vegetation which is necessary for thorough protection from the wind.

The seeds of vanilla are extremely small and seedlings are never used for starting plantations, large cuttings from 6 to 12 feet long being found much more advantageous, as they yield earlier and larger crops. Thus a beginning of vanilla culture in Porto Rico would involve the importation of a large amount of stock from Mexico, or there would be a delay of several years necessary to permit the multiplication from a smaller quantity. Great care must also be exercised in such an importation. In the Seychelle Islands vanilla culture was threatened with extinction a few years since by a fungous disease, and although means of combating it have been found it is still a menace and requires constant vigilance on the part of the planter.

The details of planting, pollinating, and curing vanilla as practiced in the Seychelle Islands have been described at length in Bulletin No. 21 of the Division of Botany, United States Department of Agriculture, which should be in the hands of any who may contemplate attempting vanilla culture in Porto Rico, and it is accordingly unnecessary to include such directions here. I was informed by Mr. J. D. Sulsona, of Mayaguez, that vanilla has been introduced in that vicinity and found to thrive, but that the necessary artificial pollination had not been practiced and consequently no fruit was obtained. The warm sheltered valleys behind Mayaguez might be a favorable location for further experiments with this crop, which would have the advantage of employing a proportionally large amount of light-labor, the work of pollinating the flowers being generally carried on by women and children. It is also an industry which does not require expensive machinery or other preliminary outlays, though considerable skill and experience are necessary in the process of curing. It would seem also that the questions of methods of shading and the employment of useful trees, or at least leguminous trees, for shade and wind-breaks have not yet received proper consideration from either the theoretical or the experimental side. From Mexico we have the specious proposition that vanilla be grown on coffee trees shaded by rubber, a proposition to which there would seem to be several serious objections overlooked by the promoters.

Varital. See *Bauhinia kappleri*, *Dipholis montana*, and *Drypetes glauca*.

Varvazco.

A fragrant wood from the vicinity of Guanica. Used for closets because of its pleasant odor, and also to keep insects away. Said to injure the eyes of those who work with it.

Vega blanca. See *Brunfelsia lactea*.

Veldolaguilla. See *Verdolaguilla*.

Velvet bean. See *Mucuna utilis*.

Verbena.

A name used for a considerable number of small herbs, including *Heliotropium parviflorum*, *Bouchea ehrenbergii*, and the species of Valerianodes.

Verbena urticifolia. VERBENA ORTIGA.

Family Verbenaceae; an herbaceous annual, 60 centimeters high, found in stony, humid places. Common to the other West Indies and North America. (Stahl, 6: 208.)

Verbesina alata. CAPITANEJA.

Family Carduaceae; an erect, herbaceous annual, 50 centimeters high, found among rocks and around houses. (Stahl, 5: 131.)

Verde de saco.

A tree from the coast: height, 25 to 30 feet (7 to 9 meters); diameter, 8 to 9 inches (20 to 22 centimeters). Wood yellow, hard; specific gravity, 0.895; used in building houses. (Exp. 1857.)

Verdeseco. See *Tetrazygia elaeagnoides.*

Verdolaga. See *Portulaca oleracea.*

Verdolaguilla. See *Talinum racemosum* and *Pilea trianthemoides.*

Vernonia arborescens. TAPA-CAMINO.

A shrubby composite, 1 meter high. Three varieties are recognized by Stahl. (Stahl, 5: 101.)

Vernonia longifolia. SANTA MARIA.

A shrubby composite from the south side of the island. Two varieties, *sintenisii* and *vahliana*, have been described from Rinçon and Guanica, respectively. (Urban, Symb. 1: 456.)

Veronica. See *Stemodia durantifolia.*

Vibona. See *Gilibertia arborea* and *G. laurifolia.*

Vigna capensis. FRIJOL CIMARRON.

Family Viciaceae; an herbaceous vine, found in pastures, flowering in the rainy months. Legume, 8 to 10 centimeters long. (Stahl, 3: 72, as *Vigna vexillata.*)

Vigna catjang. FRIJOLES.

The cowpea; it is not known that an agricultural use is made of this species in Porto Rico. (Stahl, 3: 73.)

See note under *Frijoles.*

Vigna luteola. FRIJOL MARRULLERO.

A rather slender leguminous vine congeneric with the cowpea of our Southern States, but with smaller and more pointed leaves. From meadows along the coast, near Manati. (Sintenis.) Our specimens are from Lecheria, near Santurce. According to the Kew Index this species is a synonym of *V. glabra.* (Stahl, 3: 71.)

Vigna vexillata. See *Vigna capensis.*

Vijao.

Enumerated by Hill among trees used for dyeing and tanning.

Vinagrillo. See *Oxalis corniculata*, *O. frutescens*, and *Rumex crispus.*

Vinagrillo morado. See *Oxalis corymbosa.*

Vinga.

A typographical error for Vigna.

Viña. See *Hibiscus sabdariffa.*

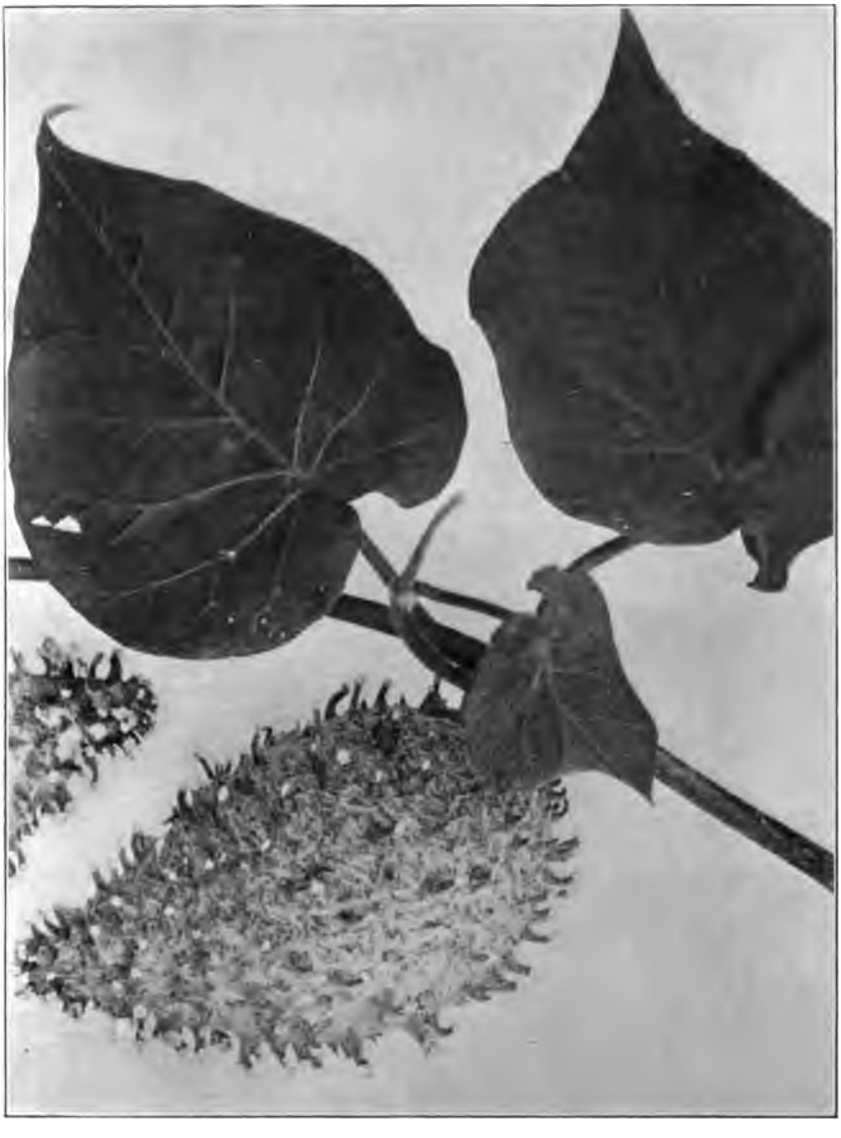
Vincetoxicum. PLATE LX.

A large genus of climbing asclepidaceous plants. Several species in addition to the following are known from Porto Rico, but mostly without native names. A specimen from Coamo (no. 750), not yet specifically identified, was called "*Guanabancilla cimarrona.*"

Vincetoxicum pubescens. GUAURO.

A twining vine, 1 to 2 meters high, on clay soils. (Stahl, 6: 88, as *Gonolobus pubescens.*)

Violeta. See *Anoda hastata.*



GUANABANCILLA CIMARRONA (VINCETOXICUM SP.)

Vitex divaricata. PÉNDULO BLANCO.

Family Verbenaceae; a tree 10 meters high, with strong wood and white bark; found in the mountains, flowering in May. Common to the Antilles. Bello gives the common name "higuerillo." (Stahl, **6**: 217.)

Vitis acida. CARO AGRIO.

Family Vitaceae; an indigenous grapevine found on the east and south coasts; flowers in autumn. (Stahl, **2**: 181.)

Vitis caribaea. PARRA CIMARRONA. Also called "bejuco de agua."

A vine covered with a white powder found in the mountains; flowers in March and April. (Stahl, **2**: 182.)

Vitis sicyoides. CARO.

An indigenous grapevine found in all parts of the island. Our specimens were collected at Coamo Springs. Bello's version of the name is "bejuco de caro." (Stahl, **2**: 179.)

Vitis trifoliata. CARO DE TRES HOJAS.

A climbing vine found in the mountains. (Stahl, **2**: 180.)

Vitis vinifera. GRAPE. UVA.

The European grapevine is cultivated with partial success on the drier southern and western parts of the island. Several apparently thrifty grapevines were seen about Ponce. This grape is quite different from our American stock in its climatic requirements, being able to withstand long drought in very loose and porous soil.

Viuda. See *Distictis lactiflora.*

Volatines de cinco. See *Gynandropsis.*

Volatines preciosos. See *Gynandropsis speciosa.*

Volatines punzantes. See *Cleome spinosa.*

Vomitel colorado. See *Cordia sebestena.*

Waltheria americana. See *Waltheria indica.*

Waltheria calcicola.

Family Sterculiaceae; a shrub 1 or 2 meters high, recently described from Tallaboa. (Urban, Symb. 1: 475.) Also found near Penuelas.

Waltheria indica. BASORA PRIETA.

A woody annual herb, found in dry, sandy places; flowers in spring. The common name was recorded by Bello, who gives, in addition, "malvabisco." (Stahl, 2: 111, as *Waltheria americana.*)

Water lemon.

Mentioned by Ober in a list of fruits of Porto Rico. This is the common name in the British West Indies for the fruit of the passion flower (*Passiflora* spp.).

Wax tree. See *Sapium sebiferum.*

Wedelia. See *Stemmodontia.*

West Indian mastic. See *Bursera simaruba.*

White mangrove. See *Laguncularia racemosa* and *Avicennia nitida.*

Wild cinnamon. See *Amomis caryophyllata.*

Wild clove. See *Amomis caryophyllata.*

A Jamaica name for the bay-rum tree.

Wild liquorice. See *Abrus precatorius.*

Wild orange. See *Naranjo;* also note under *Orange, wild.*

Wild plantain. See *Heliconia.*

Willughbaeya. GUACO.

A genus of climbing composites, represented in Porto Rico by several species, some of which are known to be called "guaco." Urban describes, under the synonym Mikania, the new species *M. pachyphylla*, *M. fragilis*, *M. odoratissima*, and *M. porosa*. (Urban, Symb. 1: 463–466.)

Willughbaeya cordifolia. GUACO.

A woody annual vine growing in hedges and waste places. (Stahl, 5: 115, as *Mikania gonoclada*.)

Willughbaeya odoratissima.

This is the plant described by Stahl as *Mikania convolvulacea*. Sintenis's specimen is from Maricao. (Urban, Symb. 1: 464; Stahl, 5: 116.)

Willughbaeya porosa. GUACO DE CABRA.

A very slender species, described by Urban (as Mikania), from the vicinity of Lares. To this has now been referred Stahl's plant, described as *Mikania swartziana*. (Urban, Symb. 1: 465; Stahl, 5: 118.)

Willughbaeya scandens. GUACO FALSO.

A climbing, woody plant, found in hedges and waste places. (Stahl, 5: 117, as *Mikania scandens*.) *Mikania congesta* is included in this species.

Winter cherry. See *Physalis*.

Wissadula rostrata. PICHANA.

Family Malvaceae; an annual or biennial shrub, 1 meter high, common on the south coast. (Stahl, 2: 70, as *Abutilon periplocifolium*.)

Xanthium canadense. BARDANA MAYOR.

A composite weed well known throughout eastern North America.

Xanthium macrocarpum. BARDANA MAYOR.

A biennial shrub, 1 meter high, found near Bayamon. (Stahl, 6: 25.)

Xanthosoma. YAUTIA.

Family Araceae; in Porto Rico there are four kinds of taros, or "yautias," as they are there called. Three of them are species of Xanthosoma, a genus of aroids closely related to Colocasia, but having the leaves hastate—that is, the basal lobes are not connected behind the insertion of the stalk, as in Colocasia. The species of Xanthosoma are recognized as distinctively West Indian, and were cultivated by the Caribs when the Spaniards arrived, but curiously enough the taro is the only one which has retained a thoroughly native name. The Xanthosomas are known, respectively, as "yautia blanca," "yautia amarilla," and "yautia palma," while the taro is called "yautia malanga."

Xanthosoma violaceum.

Reported from Sierra de Luquillo.

Xanthoxylum. See *Zanthoxylum*.

Ximenia americana.

Family Olacaceae; a small tree bearing an edible drupe, of general distribution in the Tropics of both hemispheres, but not yet reported from Porto Rico.

Xylosma schwaneckeanum.

Family Flacourtiaceae; reported from Sierra de Luquillo. Urban has recently transferred *Myroxylon schwaneckeanum* to Xylosma, also *Myroxylon pachyphyllum*. (Urban, Symb. 1: 371.)

Yagrume. See *Didymopanax micans* and *Didymopanax morototoni*.

Yagrume macho. See *Didymopanax morototoni*.

Yagua. See *Roystonea borinquena*.

The usual name applied to the royal palm in Porto Rico, but more strictly that of the large leaf bases used for roofs of houses and numerous other domestic purposes. Hill writes under the erroneous impression that the yagua palm is different from the royal palm.

Yaiti.

This is preferred to the spelling "jaiti." This wood makes pretty walking sticks, half black and half white. It is a small shrub, growing on stony calcareous soil; specific gravity 0.94. (Captain Hansard.)

Yam. See *Dioscorea.*

Yam bean. See *Pachyrrhizus tuberosus.*

Yaray. See *Inodes causiarum* and *Thringis laxa.*

Yautia. See *Xanthosoma* and *Colocasia esculenta.*

Yautia amarilla. See *Xanthosoma.*

Yautia blanca. See *Xanthosoma.*

Yautia palma. See *Xanthosoma.*

Yautia malanga. See *Colocasia esculenta.*

Yaya. See *Oxandra laurifolia.*

A hard wood; specific gravity, 0.74; not used much on account of its tendency to split. (Captain Hansard.)

Yayajabico. See *Sarcomphalus retusus.*

Yellow yam. See *Dioscorea cayennensis.*

Yerba capitana. See *Phoradendron chrysocarpum*, *P. quadrangulare*, and *P. dichotomum.*

Yerba de burro. See *Elephantopus.*

Yerba de cabra. See *Porophyllum macrocephalum.*

Yerba de cancer. See *Ammannia latifolia* and *A. humilis.*

Yerba de clavo. See *Jussiaea suffruticosa* and *Centella asiatica.*

Yerba de clavo acuatico. See *Jussiaea repens.*

Yerba de clavo aguada. See *Jussiaea linifolium.*

Yerba de clavo palustre. See *Jussiaea palustris.*

Yerba de clavo peluda. See *Jussiaea peruviana.*

Yerba de contrabando. See *Alysicarpus vaginalis.*

Yerba de cotorra. See *Heliotropium indicum.*

Yerba de cuarto. See *Hydrocotyle umbellata* and *H. hirsuta.*

Yerba de culebra. See *Bacopa monniera;* also *Heliotropium indicum.*

Yerba de culebra amarilla. See *Bacopa chamaedryoides.*

Yerba de estrella. See *Drymaria cordata.*

Yerba de faja. See *Sparganophorus vaillantii.*

Yerba de guava. See *Peperomia portoricensis* and *Coccocypselum repens.*

Yerba de Guinea. See *Panicum maximum.*

Yerba de hicotea. See *Polygonum acre* and *Castalia.*

Yerba de hierro. See *Alectra brasiliensis.*

Yerba de lombrices. See *Spigelia anthelmia.*

Yerba de papagayo. See *Blechum brownei.*

Yerba de peo. See *Porophyllum macrocephalum.*

Yerba de plata. See *Rolandra argentea.*

Yerba de quarto. See *Hydrocotyle umbellata.*

Yerba de San Juan. See *Pectis humifusa.*

Yerba de San Martin. See *Sauvagesia erecta*

Yerba guinea. See *Panicum maximum.*

Yerba graciosa. See *Ilysanthes riparia.*

Yerba lanuda. See *Gnaphalium purpureum.*

Yerba maravilla. See *Ruellia coccinea.*

Yerba mora.

In Cuba this name is applied to *Solanum nigrum.*

Yerba oldenlandia. See *Oldenlandia corymbosa.*

Yerba para. See *Panicum molle.*

Yerba parrera. See *Gesneria portoricensis.*

Yerba porosa. See *Porophyllum ruderale.*

Yerba rosario. See *Aeschynomene.*

Stahl applies this name to three species, *sensitiva*, *americana*, and *glandulosa;* the last stands as a synonym of the second in the Index Kewensis.

Yerba veronica. See *Gerardia domingensis.*

Yuca. See *Manihot utilissima* and *M. aipi.*

Yucca.

In books on Porto Rico this is usually an erroneous spelling for yuca, the current name for the cassava, manioc, or mandioca plant, *Manihot utilissima.* The name yucca belongs to a genus of liliaceous plants of which the Spanish bayonet, *Yucca baccata*, is perhaps the best-known example.

Yuquilla. See *Maranta arundinacea.*

In Cuba this name is applied to *Curcuma longa* and, in combination, to several species of Zamia, presumably because employed in the production of starch, but in Porto Rico we heard it also in connection with Maranta. It is the diminutive of yuca, doubtless in allusion to the similarity of the thickened rootstocks to the roots of cassava.

Zagrumo hembra.

A tree from all parts of the island: height, 25 to 30 feet (7 to 9 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood white, soft; specific gravity, 0.513; not used. (Exp. 1857).

Zagrumo macho.

A tree from all parts of the island: height, 25 to 30 feet (7 to 9 meters); diameter, 8 to 10 inches (20 to 25 centimeters). Wood white, soft; specific gravity, 0.243; not used. (Exp. 1857).

Zaiti.

A tree from the eastern part of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 18 to 20 inches (45 to 50 centimeters); wood yellow, very hard; specific gravity, 0.983; used in making furniture. (Exp. 1857.)

Zaiti negro.

A tree from the east end of the island; height, 25 to 30 feet (7 to 9 meters); diameter, 8 to 10 inches (20 to 25 centimeters); wood dark yellow, very hard; specific gravity, 1.200; used in making furniture. (Exp. 1857.)

Zambumbia.

According to Ober, a Porto Rican drink made by diluting cane juice.

Zamia portoricensis. MARUNGUAY.

Family Cycadaceae; a narrow-leaved species recently described by Urban from the vicinity of Guanica. (Urban, Symb. 1: 291.)

Zamia erosa. MARUNGUAY.

What appears to be a previously undescribed cycad was found in the forests covering the rough limestone hills to the south of Vega Baja. It is peculiar in having but one or two fronds with distant, broad, apically erose-dentate leaflets. The large fleshy root is hidden in crevices of the jagged rocks, but is dug out by the natives and used in the manufacture of starch.

Zanthoxylum acuminatum. ESPINO.

A shrubby tree reported from Ponce. (Stahl, **2:** 177.)

Zanthoxylum aromaticum. See *Fagara caribaea.*

Zanthoxylum caribaeum. See *Fagara caribaea.*

(Stahl, **2:** 177.)

Zanthoxylum clava-herculis. See *Fagara martinicensis.*

Zanthoxylum microphyllum. See *Fagara spinifex.*

Zanthoxylum ochroxylum. See *Fagara monophylla.*

Zapote. See *Achras sapota.*

A tree from all parts of the island; height, 40 to 45 feet (12 to 14 meters); diameter, 12 to 15 inches (30 to 37 centimeters); wood red, hard; specific gravity, 1.150; used for cabinetmaking. (Exp. 1857.)

Zaragoza mangrove. See *Conocarpus erectus.*

Zarza. See *Mimosa ceratonia.*

Zarza de cercas. See *Caesalpinia sepiaria.*

Zarzabacoa.

A name used for numerous species of Meibomia and Lespedeza.

Zarzabacoa cola de escorpion. See *Meibomia scorpiurus.*

Zarzabacoa comun. See *Meibomia incana.*

Zarzabacoa de dos hojas. See *Zornia diphylla.*

Zarzabacoa de monte. See *Meibomia axillaris.*

Zarzabacoa de tres flores. See *Meibomia triflora.*

Zarzabacoa dulce. See *Meibomia mollis.*

Zarzabacoa enana. See *Stylosanthes procumbens.*

Zarzabacoa espiral. See *Meibomia spiralis.*

Zarzabacoa galana. See *Meibomia adscendens.*

Zarzabacoa peluda. See *Meibomia barbata.*

Zarzabacoa torcida. See *Meibomia tortuosa.*

Zaya.

A tree from all parts of the island; height, 45 to 50 feet (13 to 15 meters); diameter, 9 to 10 inches (22 to 25 centimeters); wood light, soft; specific gravity, 0.733; used in building houses. (Exp. 1857.)

Zea mays. CORN. MAIS.

In Porto Rico and, in fact, throughout the West Indies corn is a much less important crop than in other parts of Spanish America, its place being taken to a great extent by root crops. The samples which were seen were all poor.

Captain Hansard states that no selection is practiced, and the varieties thus deteriorate, although the crop grows in almost any part of the island, preferably on sandy loam. Clay is to be avoided.

It is marketed by the hundred ears or by the fanega of 600 ears. It is very useful as a catch crop and to shade young trees, such as coffee.

Zerrezuela.

Enumerated by Hill among forest trees yielding timber and fuel.

Zingiber officinale. GINGER. GENGIBRE.

Ginger consists of the fleshy rootstocks of a plant with somewhat grass-like leaves but related to turmeric, arrowroot, and cardamon. Ginger is one of the comparatively few tropical export crops from which returns can be expected within a single year. The question of quality is, as elsewhere, one of great importance, as shown by the fact that Jamaica ginger is quoted in the American wholesale market at 19 to 20 cents, while African and Calcutta command only 7½ to 9 and Cochin China 9 to 13. Under favorable conditions ordinary ginger can be produced as low as 2 cents a pound, and if marketed at 3 or 4 cents is a profitable crop unless the expense of transportation is too great. The high price of Jamaica ginger does not represent a proportional profit on account of the loss in weight and because of the additional labor of peeling and scraping the rootstocks, a process which permits better curing and more rapid drying. Some of the inferior grades of ginger are marketed just as dug from the ground, although a more or less thorough process of washing is general.

In Jamaica, however, each piece is carefully peeled, an operation requiring considerable experience and dexterity for rapid work between the "fingers" or branches of the rootstock. After peeling, the ginger is washed in water, in which it is usually allowed to remain overnight. The peeling and soaking in water remove a part of the oils and resins which give the pungent and aromatic quality, the ranker elements of which are said to be located in the skin. Artificial bleaching by means of sulphur or other chemicals is seldom practiced by the planters, but importers may resort to it for the improvement of the appearance of low-grade ginger, though said to injure the flavor.

The peeled ginger dries in a week or ten days, while the unpeeled requires three weeks or more, and experiments in Jamaica showed that the color is darker and the flavor distinctly inferior.

The superiority of Jamaica ginger is also probably due in part to the cultivation of a special variety, though this is a matter not yet well understood. In the ginger cultivated in Liberia and probably in Sierra Leone a height of 2 feet is seldom exceeded, and blossoming rarely, if ever, occurs; but the Jamaica ginger is described as reaching 5 feet and is said to flower regularly in September. There are two varieties, the white, yellow, or flint, and the blue or turmeric ginger, the latter being distinctly inferior both in texture and flavor. In one the fresh rootstock is yellow, in the other bluish; but the leaves and other features are quite the same.

Most of the ginger of Jamaica is grown at altitudes above 2,000 feet, in districts where a heavy rainfall is the rule, the general average for the ginger districts for several years being over 7 feet, though in one place a maximum of 281 inches, over 23 feet, is said to have been recorded. Limestone soil with a generous admixture of humus is considered best, though other conditions may give good results. Stiff clay or light sand is not favorable, and there must be adequate drainage or the ginger will rot in the ground. Semler advocates the planting of ginger on ridges thrown up between furrows made with a shovel plow. That this would be an advantage on moist, level ground is evident, but in other situations it may not be equally desirable.

Nearly all of the ginger of Jamaica is grown by small cultivators, and it is estimated that from 25,000 to 50,000 people are dependent upon this industry. Little attempt is made at maintaining the fertility of the soil, and as ginger is an exhausting crop the ginger grower frequently changes his ginger bed to a new clearing in the forest. Very small ginger farms are the rule, much of the total crop being assembled from little patches of a few square feet or rods, while five or six acres is considered a maximum effort. The possibility of profitable culture on a large scale has been considered by many cultivators, but the opinion is prevalent that organized effort can not compete with the desultory methods of the

Jamaican natives until machines can be invented to replace the hand labor required in peeling and curing. Abrasion in a rotary drum is described by Semlar as in use in the West Indies, but there is no indication of any general adoption of this method of curing.

Planting takes place in Jamaica in March and April, the ends of the "fingers" bearing the terminal buds being buried in holes or trenches 2 or 3 inches (50 to 75 millimeters) deep, and 12 to 18 inches (30 to 45 centimeters) apart. Shade is not necessary, and all weeds should be removed, though it is considered bad policy to disturb the ground after the plants have reached any considerable size. Blossoms appear in September, and harvest extends from December to March. The rootstocks should not be dug until the plant has withered, and they can without detriment be left in the ground for a considerable period after ripening.

Zingiber zerumbet. BITTER GINGER. GENGIBRE AMARGO.

The different species and varieties of ginger have given systematic botanists no little difficulty, and there is still much uncertainity and confusion. There seems, however, to be no reason why the plant called "gengibre amargo" or "bitter ginger" by the Porto Ricans should not be referred to *Z. zerumbet*, although no flowers were seen. The rootstock is much larger, thicker, and more cylindrical than the genuine ginger; the taste is rank and bitter, with but little of the true ginger flavor. The Porto Ricans look upon it as a medicine rather than as a spice and use it mostly in the form of a tincture with rum, both as an external and as an internal remedy.

Zizyphus reticulata. AZUFAIFO.

Family Rhamnaceae; a smooth shrub, 2 to 3 meters high, found in limestone rocks. (Stahl, **4**: 32.)

Zornia diphylla. ZARZABACOA DE DOS HOJAS.

Family Viciaceae; an herbaceous annual, reclining or diffuse, in sandy pastures. Common to all tropical America. (Stahl, **3**: 34.)

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SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM

# CONTRIBUTIONS
FROM THE
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A STUDY OF CERTAIN MEXICAN AND GUATEMALAN SPECIES OF POLYPODIUM

By WILLIAM R. MAXON

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NOTE.

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PREFACE.

The accompanying paper, by Mr. William R. Maxon, aid in cryptogamic botany, United States National Herbarium, is a fragmentary contribution to our knowledge of the fern flora of the southern countries of North America. The conclusions reached by the author are the result of a careful study of a limited series of specimens. They serve to suggest how large an amount of new systematic facts are likely to be discovered by an exhaustive collection and thorough herbarium study, by modern taxonomic methods, of the fern flora of tropical America.

FREDERICK V. COVILLE,
Curator of Botany.

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A STUDY OF CERTAIN MEXICAN AND GUATEMALAN SPECIES OF POLYPODIUM.

By William R. Maxon.

An attempt to determine a small collection of Mexican ferns made by Dr. J. N. Rose in 1901 has brought to my attention the fact that a number of very variable as well as perfectly distinct forms have been referred commonly to either *Polypodium subpetiolatum* or *P. biserratum*, and that the proper application of the latter name has long been a matter of uncertainty. The present paper, based upon studies of material in practically all leading American herbaria, is offered as the result of an effort to reduce the existing confusion. The several species here proposed as new are certainly distinct from *subpetiolatum*, and several of them are not even closely related to that species. It is not absolutely certain that *biserratum* is identical with *subpetiolatum*, but the evidence gained from specimens at hand strongly indicates such a conclusion.

My thanks are due to the several botanists and curators of the herbaria mentioned hereafter[a] for the loan of specimens, and particularly to Professor L. M. Underwood for helpful suggestions.

Polypodium subpetiolatum Hook. in Benth. Pl. Hartw. 54. 1840.

The original description, published by Hooker, is as follows:

Polypodium (*Eupolypodium*) *subpetiolatum*, Hook. MS., fronde ovato-lanceolata pinnata, rhachibus costa venis subtus marginibusque pubescenti-hirsutis, pinnis alternis remotis lanceolato-acuminatis undique serrulatis subcoriaceo-membranaceis, inferioribus basi oblique truncatis brevissime petiolatis petiolis superne alatis, superioribus basi oblique cuneatis sessilibus, supremis basi decurrentibus adnatis, soris rotundatis uniserialibus.—Caudex repens, crassitie pennae anserinae, squamosus. Stipes 4–5–pollicaris. Frons pedalis. Venae obliquae 2–3–4–furcatae, basi nigricantes, venula infima superne sorifera, reliquae fere ad marginem attingentes, apicibus clavatis. (*Hooker.*)—Regla.

Hooker redescribed and figured the species without mention of additional specimens in the Icones.[b] The emended description contains no mention of margins

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[a] In this paper the letters C, E, G, M, N, S, U, and Y refer respectively to the Columbia University Herbarium, the D. C. Eaton Herbarium at Yale University, the Gray Herbarium of Harvard University, the Missouri Botanical Garden Herbarium, the U. S. National Herbarium, the private herbarium of Capt. John Donnell Smith, the Underwood Herbarium, and the New York Botanical Garden Herbarium.

[b] Hook. Ic. Pl. **4**: *pl. 391–392.* 1841.

"pubescenti-hirsutis" or of veins "basi nigricantes," nor does the illustration show ciliate margins. Otherwise the descriptions agree. Regla, which is not on most maps, is not far from Pachuca, Hidalgo, but at a somewhat lower altitude.

Polypodium biserratum Mart. & Gal.[a] I can but regard as a synonym of *P. subpetiolatum*. It was described from Galleoti's no. 6410, said to have been found in humid, cool situations in the eastern cordillera of Oaxaca, in the zone of vegetation ranging from 2,000 to 2,300 meters in altitude.

Specimens examined:

Michoacan: Hills of Patzcuaro, on trees and rocks, November, 1890, C. G. Pringle, no. 3328 (N, E, G, M—2 sheets, S, U, as *P. subpetiolatum*).

Federal District: Forest near San Nicolas, Bourgeau, July, 1866, no. 1038 (N, E, G, as *P. biserratum*).

San Luis Potosi: Near city of San Luis Potosi, W. Schaffner, October, 1879 (U).

An examination of the fine series of Mr. Pringle's 3328 shows a high degree of variability. Fournier[b] listed *subpetiolatum* and *biserratum* separately, noting that the former "differt a P. biserrato frondulis angustioribus, soris approximatis;" and even Hooker[c] in uniting them was inclined to shift responsibility upon Mettenius. It is not difficult to understand how, from insufficient material, Fournier's view may appear correct, but it seems pretty plain, upon examination of the series of Mr. Pringle's 3328, that the term *biserratum* has been applied to the more or less infertile states of true *subpetiolatum*. For example, the Bourgeau specimens (no. 1038), labeled *biserratum* agree well with the less fertile and (consequently) more leafy individuals of 3328; yet the more perfectly fertile fronds of 3328 would be referred without question to *subpetiolatum*. Nor is 3328[d] separable into two forms; the very considerable variation extends by slight gradations from the symmetrical fertile type, figured by Hooker as *subpetiolatum*, to the leafy, irregularly serrate sort referred to by Fournier and others as *biserratum* and rather diagrammatically figured in the original publication of the species. There is, indeed, a no greater amount of variation here than is to be observed in many or perhaps a majority of the familiar ferns of the eastern United States, whose tendencies toward variability in certain directions are well known and recognized. In general, the more fertile the frond the more approximate are the sori and the less the degree of serration. Marked fertility is usually accompanied also by a loss of foliar tissue. The present case furnishes an excellent illustration. The Hookerian figure is a good representation of normally fertile *subpetiolatum*, except that the margin is not often so evenly serrulate, but shows usually an unmistakable tendency toward double serration. The figure shows rather more pubescence than is to be seen on the specimens cited above. In these the pubescence is mostly confined to both sides of the midveins of the pinnæ. On the underside it is rather lighter in color, longer and less matted than above, and extends only very sparingly or not at all along the veinlets. *P. biserratum* was originally described as glabrous; but no known member of the *subpetiolatum* group is absolutely without pubescence. In the several new species here proposed the quality and disposition of the pubescence have seemed valid diagnostic characters.

Polypodium schaffneri Fée[e] is often cited as a synonym of *P. subpetiolatum*, but a description seems never to have been published. The name alone was offered by

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[a] Mem. Acad. Brux. **15**^{5}: 38. *pl.* 9. *f.* 1. 1*a*. 1842.

[b] Mex. Pl. 78. 1872.

[c] Sp. Fil. **4**: 220. 1862.

[d] The rootstock, about 8 mm. thick, is densely clothed with delicate, glossy, irregularly ovate, imbricated scales, attached by their middle, of a mummy-brown verging to walnut-brown as they become long-attenuate at the base of the prominently jointed stipes. The rootstock of none of the specimens here cited under *P. subpetiolatum* shows any variation in this particular.

[e] 9^{me} Mem. 22. 1857.

Fée, followed directly by "*P. subpetiolatum*, Hook. Icon. Pl. pl. 391.2 (ex Th. Moore) Sn. Angel, et Sn. Agostin; W. Schaffner, no. 310 (1854) et au Popocatepetl No. 273."

From this it appears that Fée merely quoted Moore's opinion that the plants in hand were *subpetiolatum*, and that Fée holding them to be distinct proceeded to name them as a new species. Still, Fée does not list *subpetiolatum* in his Mexican catalogue,[a] and it is possible that he intended to displace the name *subpetiolatum* by *schaffneri*. The reason for such a change is not apparent, for Hooker's name is clearly tenable. The status of Fée's name is, it seems, problematical and unsatisfactory, though it has been cited subsequently under both *subpetiolatum* and *biserratum*.

The immediate bearing of the determination of *P. schaffneri* is that the name may eventually have to be taken up for at least a part of the following specimens (all Mexican), which I am unable at the present time to place satisfactorily:

Federal District: Near Santa Fé, Bourgeau, 1865, no. 463bis (N).

Oaxaca: Cañada de San Gabriel, altitude, 2,500 m., Conzatti & Gonzalez, no. 307 (G); Cerro de San Felipe, altitude, 2,800 m., Conzatti & Gonzalez, August, 1897, no. 430 (G).

San Luis Potosi: Near city of San Luis Potosi, W. Schaffner, September, 1879 (U, as *P. schaffneri* Fée); Parry & Palmer, "no. 973¾ pro parte" (E).

Notes upon these five sheets may be of interest. No. 463bis (ex herb. Mus. Paris) is labeled *P. subpetiolatum* with *P. schaffneri* written as a synonym. It is well matched by no. 307. Both are characterized by their strict appearance, crowded pinnæ, and close venation, and have the look of plants grown under semixerophytic conditions, such as might result from removal of forest. No. 463bis has 26 pairs of pinnæ, the stipe lacking. No. 307 is a single frond; stipe 9.5 cm. long, markedly canaliculate; lamina 25 cm. long; pinnæ about 20 pairs, the lower nearly opposite, very short-petiolate, the uppermost becoming alternate, adnate, and somewhat decurrent; pinnæ (maximum) 6 cm. long, having about 24 pairs of sori borne nearer to the midvein than to the margin, which is rather more finely serrate than is usual in *P. subpetiolatum;* veins 3-4-forked. Schaffner's plant (U) has the same strict aspect and is the same as the two preceding. The pubescence of all three is that of *subpetiolatum* (as here understood), but is more copious, and the pinnæ are for the most part distinctly petiolate. No. 430 is very similar to 307, but differs slightly in the less close venation. No. 973¾, comprising two complete fronds, does not differ essentially. All five specimens agree in their rigid strict appearance, and oblique more or less petiolate pinnæ, but do not present characters warranting their separation specifically from *subpetiolatum*. It does not seem worth while to recognize the form even subspecifically, owing to the doubt surrounding the proper application of Schaffner's name, and because of the variable characters of the plants. Further material collected completely and in good quantity would be of much interest in serving to indicate the limits of variation in plants of definitely restricted areas.

Polypodium aequale sp. nov. PLATE LXI.

Rootstock wanting; frond 4 dm. long; stipe (complete) 15 cm. long, very rigid, firmly terete; lamina 25 by 12.5 cm., very minutely glandular (apparently glabrous) below, comprising about 16 pairs of exactly opposite pinnæ of which the lowermost are 5.5 by 1.5 cm., cordate at base, sessile; the fourth and fifth pairs about 1 cm. longer and adnate upon the upper basal portion; the upper pinnæ becoming quite adnate but not decurrent; margins obscurely undulate, nearly entire; veins mostly free, but occasionally anastomosing to form large acutish areoles which extend nearly to the margin; sori about 16 pairs, large, borne on the first anterior veinlets slightly nearer to the midvein than to the margin.

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[a] 9^{me} Mem. 22. 1857.

The species is founded on no. 3263B of Capt. John Donnell Smith's Guatemalan plants, collected at San Miguel Uspantán, Department Quiche; altitude 1,800 meters, April, 1892, by Messrs Heyde & Lux. The type specimen, which is the only one known to me, is in the private herbarium of Captain Smith. The plant was distributed as *P. subpetiolatum*, but its affinities seem scarcely to lie with that group, nor does it appear closely allied to any middle American species. Its symmetry and regularity of outline have suggested the specific name here applied.

Polypodium teresae sp. nov. PLATE LXI.

Rhizome wide-creeping, clothed with light-brown imbricate chaff; frond 30 cm. long; stipe 8 cm. long; lamina 22 by 16 cm., broadly ovate, dark green, noticeably and finely pubescent over the whole lower surface, comprising about 13 pairs of subopposite ligulate membranaceous pinnæ; the lowermost pinnæ (7 cm.) decidedly petiolate and excised below, the third, fourth, and fifth pairs nearly equal (about 8 cm. by 12 to 13 mm.), the uppermost wholly adnate; margins throughout deeply and regularly biserrate; midveins not prominent, dark-colored, as are the mostly 3-forked veins; sori about 20 pairs, equidistant from midvein and margin.

The species is founded upon Dr. J. N. Rose's no. 2205, collected in the Sierra Madre, near Santa Teresa, Territorio de Tepic, Mexico, August 12, 1897. There are two sheets; one, the type, no. 301119, in the U. S. National Herbarium; the other, smaller and less characteristic, in the Gray Herbarium. Undoubtedly the plant is closely related to *subpetiolatum*, to which species Mr. Davenport referred it; but it seems sufficiently distinct in the decidedly petiolate pinnæ, more general distribution of the pubescence, position of the sori, and peculiar marginal serration.

Polypodium firmulum sp. nov. PLATE LXI.

Rhizome wide-creeping, 5 or 6 mm. thick, with yellowish brown curly chaff and copious rootlets thickly covered with a fine, linear, dark brown chaff; frond 22 cm. long; stipe about 8 cm. long, arcuate, greenish-stramineous; lamina 14 by 11 cm., broadly ovate, light green, with about 9 pairs of mostly alternate, linear-lanceolate, subcoriaceous, spreading pinnæ which are pubescent over the tissue of both sides; the lowermost pair (sterile) 5.2 cm. by 9 mm., at the base excised below from the rachis a distance of 2 mm. along the midrib to form a broad sinus, above rounded and slightly adnate; the second pair (fertile) 5.8 cm. long, similarly excised below, above less rounded and similarly adnate; the third 6 cm., the fourth 5.5 cm. long; succeeding pinnæ gradually shorter, considerably narrower, adnate, apices acute; the pinnæ undulate in drying, the revolute margins inconspicuously notched by shallow distant crenations which in the fertile pinnæ exactly correspond to the sori; sori averaging about 20 pairs, borne rather closer to the midvein than to the margin, one upon the first branch of the inconspicuous mostly 3-forked veins.

Type in the U. S. National Herbarium (no. 397,906), collected from "the shaded under sides of large oaks at Alvarez, San Luis Potosi, altitude 8,000 feet, by Dr. Edward Palmer (no. 448), September 28-October 3, 1902." Mixed in the number were plants of *P. plebejum*. The type sheet comprises four separate fronds, of which the largest has served for the above diagnosis.

The species is not very closely related to *P. subpetiolatum*, differing from that species in nearly all essential particulars. The coriaceous texture and the breadth of the frond are distinctive characters. The whitish pubescence, noticeable without a glass, is not confined to the venation, but occurs also on the leafy tissue; it is most abundant on the upper side. The sterile pinnæ are decidedly obtuse, and the fertile ones are found upon being freshened to be more or less so, though when dry they appear acute. The long, shallow crenations are unique, so far as I have observed, among the polypodies of this group.

I would refer here also specimens in the D. C. Eaton herbarium, collected by Parry & Palmer on "Lerios Mountain, 15 leagues east of Saltillo," Coahuila, Mexico, in 1880. The plants were determined by Professor Eaton as "near *P. subpetiolatum*" and are so labeled. In the published report[a] they are listed under this name with the remark "small specimens which agree best with this species." The error was perpetuated in the Biologia Centrali-Americana.[b] The specimens are too immature to have served for description, but with the material now at hand they may be definitely placed under *P. firmulum*.

Polypodium legionarium Baker in Hook. & Baker, Syn. Fil. 337. 1868.

Polypodium macrodon Hook. Sp. Fil. **4**: 218. 1862, not Reinw. (sec. Baker).

Specimens examined:

Mexico: Chiapas, Dr. Ghiesbreght, 1864–1870, no. 393 (G, E); no. 294 (E).

Guatemala: Coban, Vera Paz, altitude 1,500 meters, O. Salvin (G); without station, O. Salvin (G); Calderos, O. Salvin (G).

Of these sheets I suppose nos. 393 and 294 to be most typical of the species in its mature development. They are magnificent specimens, agreeing in every particular with Hooker's very complete and careful description so inaccurately and inadequately paraphrased by Mr. Baker. Salvin's Calderos specimen, aberrant and worn, is referred here with some doubt.

Polypodium fissidens sp. nov. PLATE LXI.

Rhizome creeping, very firm, whitish, clothed with bright brown chaff; frond 40 to 56 cm. long; stipe 10 to 18 cm. long, stramineous, distinctly articulate, pubescent above; lamina 30 to 38 cm. by 13 to 18 cm., membranaceous, ovate to obcuneiform, broadest near the base, pubescent on both surfaces; pinnæ about 30 pairs, exactly opposite, wholly adnate (excepting the lowermost two or three pairs, which may be somewhat rounded either above or below), obtusish at extremity, varying greatly in dimensions according to degree of fertility and bearing (maximum) 25 to 28 pairs of large sori near the sharply biserrate fimbriate margins on the prolonged first branches of the mainly trichotomous entirely free veins, which are rather noticeably enlarged at their extremities.

The species is founded upon no. 244 of Dr. Ghiesbreght's "Filices Austro-Mexicanae," collected in Chiapas, 1864–1870. Three sheets of this number have been examined; two in the D. C. Eaton herbarium (the larger of which is designated as the type); the third in the Gray herbarium. This number was determined by Hall[c] as *P. biserratum*, a disposition which, in view of the copious pubescence, peculiar position of the sori, fimbriate margins, and generally distinct facies of the plants, seems quite remarkable.

Polypodium adelphum sp. nov. PLATE LXII.

Rootstock creeping, about 8 mm. thick, clothed with long-attenuate chaff of a dull burnt umber, becoming lighter at the bases of the stipes; fronds 3.5 to 7 dm. long; stipe 10 to 20 cm. long, rigid and glossy; lamina 25 to 60 cm. long by 15 to 25 cm. broad, ovate, comprising from 10 to 18 pairs of membranaceous, subopposite, linear pinnæ becoming more or less alternate above; the lowermost pinnæ slightly shorter than the succeeding three or four pairs, which in the largest fronds measure about 12 to 15 cm. by 15 mm. (at the broadest point); pinnæ mostly subpetiolate, the base subacutely cuneate, and very slightly winged above, only the pinnæ of the upper half winged narrowly both above and below, finally fully adnate; the margins distinctly and uniformly shallow-crenate throughout; midvein prominent, giving rise to about 40 or 45 pairs of mostly 3-forked, free, oblique veins; sori, about 40 pairs, borne at half the distance to the margin.

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[a] Proc. Am. Acad. **18**: 183. 1883.

[b] Biolog. Central. Am. Bot. **3**: 662. 1885.

[c] Franklin W. Hall, Catalogue of a Collection of Ferns made in Southern Mexico, mainly at Chiapas, by A. Ghiesbreght, in the years 1864–1870, 2. 1873. (Pp. 10. New Haven.)

Specimens examined:

Mexico: Chiapas, Ghiesbreght, 1864–1870, no. 244 in part (G, E—2 specimens); no. 205 (E—2 specimens).

Guatemala: Santiago, Dept. Zacatepequez, altitude 6,500 feet; Rosalio Gomez, 1891, John Donnell Smith's distribution no. 945 (G, N, S).

Of these the first mentioned (in the Gray herbarium) may stand as the type. The full-page illustration accompanying is quite representative of the species, which in general appearance stands almost exactly between *P. subpetiolatum* and *P. fraternum*. From the former it is distinguished by its size, by the uniformly crenate (instead of irregularly serrate) margins, and by the slender shape of the pinnæ; from the latter by its membranaceous (instead of decidedly coriaceous) texture, entirely free venation, shorter-petiolate pinnæ, regularly crenate (instead of undulate) margins, and by its pubescence. The pubescence is, however, inconspicuous in the plants studied; above it is a short, matted tomentum, confined to the midveins of the upper pinnæ and to the terminal portion of the rachis; on the under side it is slight and to be observed only along the lower portions of the midveins. There is in the Gray herbarium an additional sheet from Chiapas, collected by Dr. Ghiesbreght (no. 260), which may or may not belong to this species. It is decidedly pubescent.

Fée's *P. cubense*[a] is, I believe, not known in American herbaria. It is, apparently, related closely to the species here described, but both description and figure represent a plant differing in several essential particulars.

Polypodium fraternum Cham. & Schlecht. Linnæa 5:608. 1830.

This species is well diagnosed by its authors. It appears to be rather variable, but is distinguished at once by the very coriaceous texture, long-petiolate, perfectly glabrous pinnæ, subundulate nearly entire margins, and somewhat anastamosing venation.

It does not appear to have been much collected, and I have seen only the following specimens:

Specimens examined:

Vera Cruz: Near Jalapa, J. N. Rose, August 13, 1901, no. 6088 (N); near Orizaba, on oaks, C. G. Pringle, January 20, 1895 (G).

State of Mexico: Borrego, Bourgeau, April 14, 1866, no. 2881 (G).

Guatemala: Santa Rosa, Dept. Baja Vera Paz, altitude 5,000 feet, H. von Türckheim, July, 1887, John Donnell Smith's distribution, no. 1291 (S).

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[a] Gen. Fil. 241. 1850–1852; 7me Mém. 61. *pl. 26. f. 1.* 1854.

PLATE LXI.

EXPLANATION OF PLATE LXI.

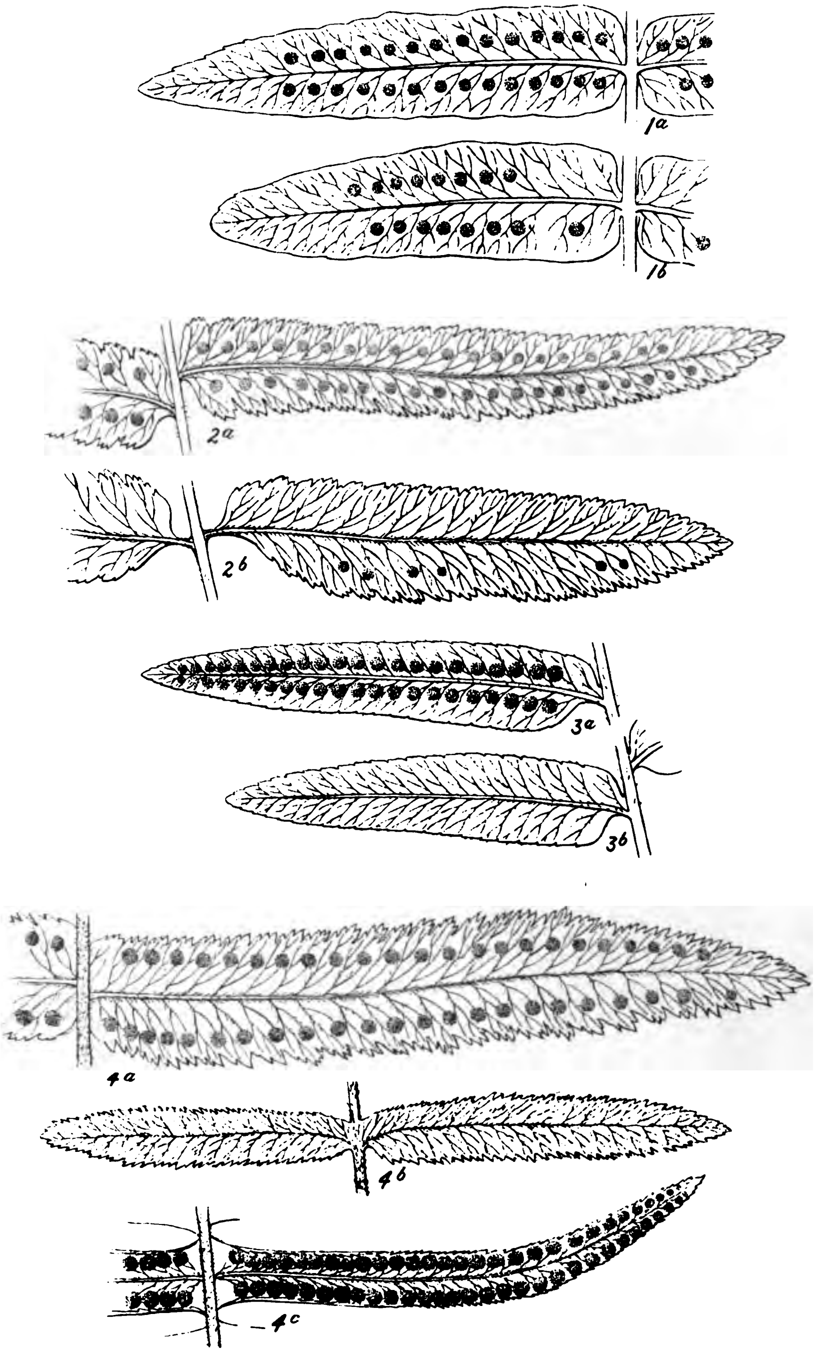
FIG. 1.—Polypodium aequale.—1a, Fourth pair of pinnæ; 1b, First pair of pinnæ.

FIG. 2.—Polypodium teresae.—2a, Fifth pair of pinnæ; 2b, First pair of pinnæ.

FIG. 3.—Polypodium firmulum.—3a, Fifth pinna; 3b, Lowermost pinna, the origin of the subopposite one indicated.

FIG. 4.—Polypodium fissidens.—4a, Fifth pair of pinnæ of type frond; 4b, First pair of pinnæ of a small frond; 4c Sixth pinna of a third frond, very fertile.

PLATE LXI.

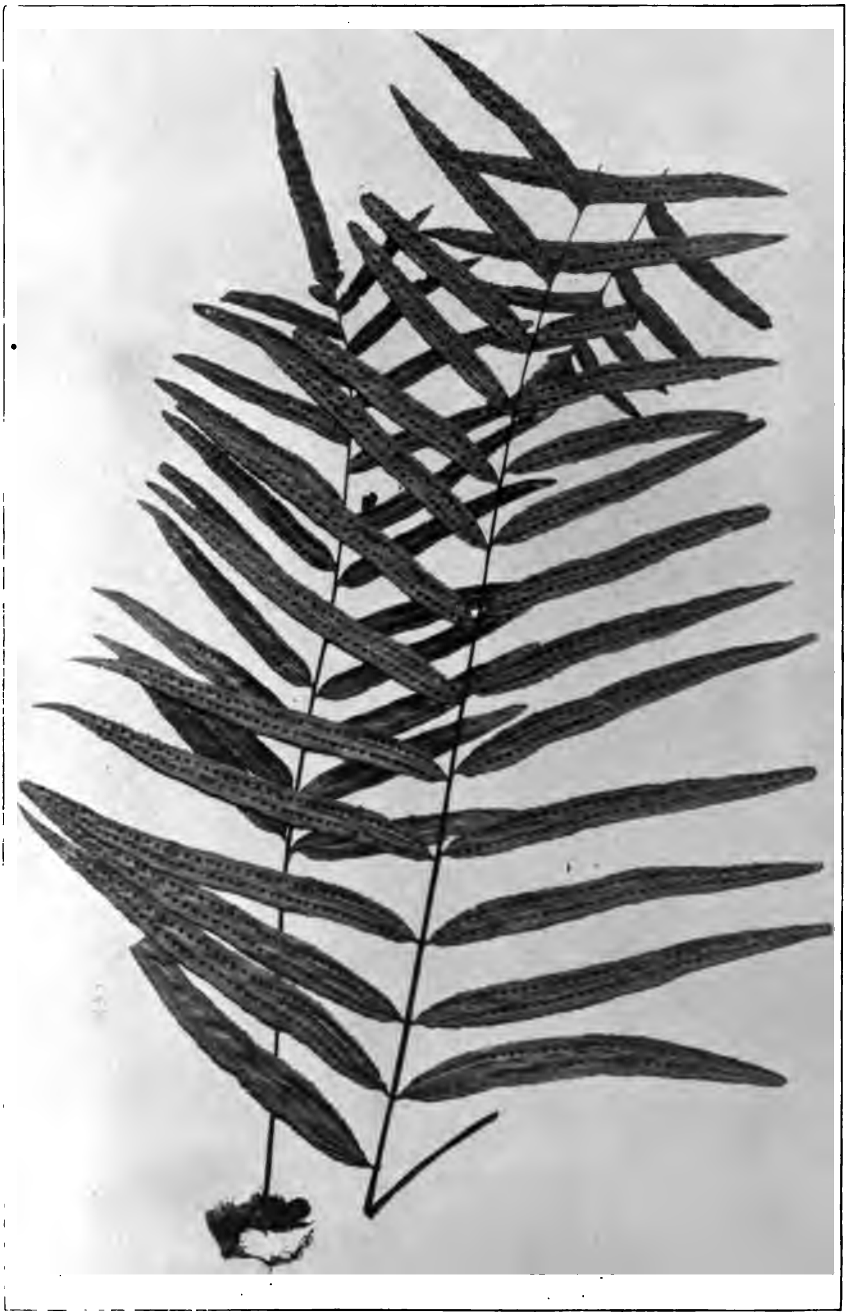


PINNÆ OF POLYPODIUM SPP.

PLATE LXII.

EXPLANATION OF PLATE LXII.

Photograph of type specimen of *Polypodium adelphum* (in Gray Herbarium) collected by Ghiesbreght in Chiapas, Mexico.



POLYPODIUM ADELPHUM MAXON.

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM

CONTRIBUTIONS

FROM THE

UNITED STATES NATIONAL HERBARIUM

VOLUME VIII, PART 4

STUDIES OF MEXICAN AND CENTRAL AMERICAN PLANTS—No. 4

By J. N. ROSE

WASHINGTON
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PREFACE.

The present paper is the fourth of a series by Dr. J. N. Rose, entitled "Studies of Mexican and Central American Plants," the earlier numbers of which were published in previous issues of the Contributions from the United States National Herbarium. Since the preceding number of the Studies was published, Doctor Rose has made a fourth journey to Mexico, and a part of the information and material thus acquired by him has been utilized in the present paper. Throughout the progress of the work the scientific value of this field experience has been manifest, and the wisdom of the policy of giving the critical student opportunities of this kind has been confirmed.

Frederick V. Coville,
Curator of the United States National Herbarium.

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STUDIES OF MEXICAN AND CENTRAL AMERICAN PLANTS—NO. 4.

By J. N. Rose.

INTRODUCTORY NOTES.

These studies, continued from page 55 of this volume, consist chiefly of descriptions of new Mexican plants, most of which have been on hand several years, but a few of which are from collections made during the past season. None have been described until all the known Mexican species related to them were studied and in most cases a synopsis of the genus prepared. So many questions in nomenclature require further investigation and so many citations must be verified that there are many of our Mexican genera of which it seems impossible as yet to present a synopsis. As some of the species described below have long been named and distributed to our larger herbaria, it is important that these at least should be published.

Since my last paper of this series was published I have made a fourth journey to Mexico, this time in company with Mr. Joseph H. Painter, who proved himself a most earnest and valuable assistant. The time spent in Mexico was about two and a half months (August 7 to October 20, 1903).

Considerable work was done about the City of Mexico, especially on the high mountains which form the rim of the valley of Mexico. From here we made excursions, spending several days at Cuernavaca, two at Pachuca, one at Toluca, two at Yautepec, one at Tultenango Canyon, and one at Aguas Calientes. A number of these trips were made to find long-lost species of Humboldt, Hartweg, and other collectors and to look for Crassulaceae and Cacti. On some of these trips I had as my companion Mr. C. G. Pringle, whose knowledge of the plants of central Mexico made his services most valuable to me. The last of August we all moved to Guadalajara, where extensive work was done in the great barranca of the Santiago, at Rio Blanco, where Dr. E. Palmer collected so many new species in 1887—several days about Lake Chapala and one at Etzatlan. At Guadalajara we were joined by Mr. E. W. D. Holway, who later accompanied us in the ascent of the Volcano of Toluca. Two days were spent on the slope of the volcano, where many interesting plants were obtained. Our stay in the crater was marked by a cold rain and snow storm, which made collecting nearly impossible and cut off what must be one of the most glorious views in all America.

The following table will show in detail the places visited, the date of each visit, and the number of miles traveled in 1903:

Table of itinerary.

			Miles.
		Washington to Laredo	1,976
Aug.	17.	Laredo to City of Mexico	840
	20.	City of Mexico to Tlalpam and return	15
	21.	City of Mexico to San Angel and return	10
	22.	City of Mexico to Sante Fé and return	20
	23.	City of Mexico to Sante Fé and return	20
	24.	City of Mexico to Sierra Guadalupe and return	10
	26.	City of Mexico to Yautepec	98
	26, 27.	Yautepec to local stations	16
	28.	Yautepec to City of Mexico	98
	30.	City of Mexico to Tequixquiac and return	74
	31.	City of Mexico to Pachuca	94
	31.	Pachuca to Real del Monte	10
Sept.	1.	Pachuca to mountains and return	10
	2.	Pachuca to City of Mexico	94
	3, 4.	City of Mexico to Toluca and return	90
	6.	City of Mexico to Guadalupe and return	10
	8–10.	City of Mexico to Cuernavaca and return	148
	9, 10.	Cuernavaca to the pedregal (twice) and return	32
	14.	City of Mexico to Salazar and return	50
	16.	City of Mexico to El Salto and return	80
	17.	City of Mexico to Eslava and return	39
	19.	City of Mexico to Cima and return	75
	21.	City of Mexico to El Parque and return	115
	23.	City of Mexico to Sierra Guadalupe and return	20
	25.	City of Mexico to Guadalajara	381
	28.	Guadalajara to the barranca and return	15
	29.	Guadalajara to the barranca and return	12
	30.	Guadalajara to Sierra de San Esteban and return	20
Oct.	1–3.	Guadalajara to Etzatlan and return	128
	4–6.	Guadalajara to Chapala and return	70
	7.	Guadalajara to City of Mexico	381
	8–11.	City of Mexico to Aguas Calientes and return	728
	13.	City of Mexico to Tultenango and return	202
	14.	City of Mexico to Toluca	45
	15, 16.	Toluca to Calamaya	24
	16.	Calamaya to the crater of Toluca and return	30
	17.	Toluca to City of Mexico	45
	18.	City of Mexico to Santa Fé and return	20
	20.	City of Mexico to Eagle Pass	1,089
		Eagle Pass to Washington	1,991
		Total miles traveled	9,225

In September and October the plant life was at its best, at which time plain and mountain are covered with flowers, in strong contrast with the desolation of May and June. It is not surprising, therefore, that we reaped an abundant harvest. The herbarium material collected embraces about 2,000 numbers (nos. 6451–8221). The collection is a general one, embracing nearly all groups, but especially those in which I have been carrying on particular work, such as the Crassulaceae, Cactaceae, Umbelliferae, etc.

Besides this herbarium material more than two hundred species of bulbs, roots, and succulents were sent to Washington. Many of these have flowered, and most of the others are now in good condition. Many have been distributed to other institutions, and a considerable number of the succulents can still be obtained by applying to the Department of Agriculture. The accompanying list, while it consists mostly of my introductions of 1903, also includes some obtained previously, but not heretofore reported, or in which the names have been corrected.

It is not claimed that all these plants are new introductions, but many of them are. In many cases my material came from the type localities of rare species, while not a few, especially of the succulents, are entirely new to science.

Mexican plants recently introduced by J. N. Rose.—No. 3.

Name.	Catalogue number.	Remarks.
CRASSULACEAE.		
Echeveria glauca Baker	920 705	Leaves broader than in common forms.
Echeveria elegans Rose, ined	737	Beautiful plant for bedding.
Echeveria secunda Lindl	757 835	Sends out many offshoots.
Echeveria sp	789	Not yet flowered.
Echeveria sp	790	Not yet flowered.
Echeveria maculata Rose	817, 910, & 923	Has frequently flowered.
Echeveria mucronata Schlecht	834	Has beautiful red flowering stems.
Echeveria pringlei Rose	870	Has flowered once.
Echeveria sp	903	Has not flowered.
Echeveria subrigida Rose	909	A most beautiful foliage plant.
Echeveria sp. nov	918	Not yet flowered.
Echeveria sp. nov	767	Sent by Mr. C. G. Pringle.
Echeveria nuda	930 & 936	Sent by Doctor Purpus.
Echeveria cuspidata Rose	509	Sent by Dr. E. Palmer.
Echeveria sp. nov	11005	Sent by E. A. Goldman.

Mexican plants recently introduced by J. N. Rose.—No. 3—Continued.

Name.	Catalogue number.	Remarks.
CRASSULACEAE—continued.		
Echeveria subsessile Rose sp. nov	11018	Sent by Dr. Wm. Trelease. Beautiful foliage.
Echeveria pubescens Hook	11061	Sent by Mr. Pringle.
Echeveria pulverulenta Rose	4994	A beautiful species; has often flowered.
Echeveria nodulosa Baker	6391	Has frequently flowered.
Echeveria coccinea Cav	87	Has frequently flowered.
Echeveria minutiflora Rose	4704	Flowered in 1899.
Echeveria platyphylla Rose	9393	Often flowered.
Echeveria lozani Rose	969	Sent by Mr. Pringle.
Echeveria multicaulis Rose	628	Sent by Nelson & Goldman.
Echeveria obtusifolia Rose	653	Sent by Mr. Goldman and Mr. Pringle.
Echeveria palmeri Rose	471	Sent by Doctor Palmer.
Echeveria racemosa Cham. & Schlecht	316	From type locality.
Echeveria strictiflora Gray	943	Sent by Doctor Palmer.
Echeveria teretifolia DC.?	952	Sent by Doctor Purpus.
Echeveria walpoleana Rose	506	Sent by Doctor Palmer.
Altamiranoa batesii Rose	711	Flowered in 1904.
Altamiranoa elongata Rose	738	Flowered in 1903.
Altamiranoa goldmani Rose	....	Flowered in 1903.
Altamiranoa scopulorum Rose	....	Living material now only at Kew.
Sedum oxypetalum H. B. K	851, 755	A tall compact shrub.
Sedum prealtum DC.?	751, 752, 736	Often cultivated, sometimes 6 feet high.
Sedum moranense H. B. K	744, 735, & 754	Leaves very short, compact.
Sedum guadalajaranum S. Wats	881	Leaves linear, sage green.
Sedum longipes Rose	839	Low trailing plant.
Sedum heterophyllum Rose	921	Delicate little plant with compact rosette.
Sedum insertum Hemsley	775	Valley of Mexico.
Sedum retusum Hemsley	477	Sent by Doctor Palmer from type locality.
Sedum palmeri S. Wats	766	Sent by Doctor Palmer.
Sedum sp	845	Has not yet flowered.
Tillaea connata Ruiz & Pav	775	Flowered in cultivation.
Tillaeastrum pringlei Rose	837	Flowered in cultivation.
Villadia parviflora Rose	712	
Villadia sp	820	
Villadia painteri Rose	879	Flowered in cultivation.

Mexican plants recently introduced by J. N. Rose.—No. 3—Continued.

Name.	Catalogue number.	Remarks.
CRASSULACEAE—continued.		
Villadia cucullata Rose	....	Flowered in cultivation.
Villadia stricta Rose	512	Flowered in cultivation.
Villadia nelsoni Rose	691	Flowered in cultivation.
Villadia ramosissima Rose	692	Flowered in cultivation.
CACTACEAE.		
Cereus sp	785	
Cereus sp	893	
Cereus sp	872	
Echinocactus sp	....	
Echinocactus sp	495	
Echinocactus sp	908	
Echinocactus sp	740	
Mamillaria sp	821	
Mamillaria sp	822	
Mamillaria sp	830	
Mamillaria pringlei (Coult.)	855	
Mamillaria sp	858	
Mamillaria sp	225	
Mamillaria conimamma Link	203	June, 1901.
Mamillaria carnea Zucc	977	Flowered in 1904.
MISCELLANEOUS SPECIES.		
Agave sp	778	
Agave intrepida Greenm	849	
Furcraea sp	749	
Prochnyanthes virescens S. Wats.	874	Flowered in September, 1904.
Hecria elegans Schlecht	....	Flowered in April, 1904.
Sprekelia formosissima Herb	813	Flowered in April, 1904 and 1905.
Polyanthes geminiflora Rose	913	Flowered in July, 1904.
Tradescantia crassifolia var	891	Flowered in October, 1904.
Isochalis linearis R. Br.?	312	Flowered in October, 1904.

Among these introduced plants attention is called to the following:

(1) The species of Crassulaceae. For the past three years I have given a good part of my time to the study of the Crassulaceae, during which period there has been gathered in Washington probably the choicest collection of this kind ever brought together. The total number of pots on hand in September, 1904, was 1,075. This does not, of course, show the richness but the size of the collection. At one time in 1904 ten of the twelve species of Stylophyllum were in bloom

together; six of the seven species of Sedastrum and all three of the Mexican species of Lenophyllum have been grown; nearly fifty species of Dudleya have been under observation, besides many of the species of Sedum, Altamiranoa, Villadia, and other smaller genera.

It is among the Echeverias, however, that I have had the finest representatives of this family, some of which promise to be of considerable horticultural value. Of the forty-five species of this genus recognized as distinct, I have forty now in cultivation. Among these the the most promising are the following:

Echeveria elegans, of steel-green color, forming dense rosettes of thick leaves sometimes becoming tinged with red.

Echeveria subsessilis and *E. cuspidata*, good bedding plants, both forming very compact rosettes, the first of a pale bluish color, the other of a bronze color.

Echeveria palmeri and *E. subrigida*, large species with broad, highly tinted leaves. The latter is an especially desirable plant for cultivation. In the City of Mexico it is used in beds as corner pieces, often forming heads a foot in diameter.

Echeveria multicaulis is a tall species with shining leaves, which are often tinted.

The genus Oliverella, named for Mr. George W. Oliver, of Washington, has proved to be one of my most valuable introductions. It is easily propagated and grows rapidly, flowering the first season after cuttings are taken. It often forms large plants with weak, sometimes hanging, branches, and very large red flowers. All of my living plants have been cared for by the Bureau of Plant Industry of the Department of Agriculture. A great many plants have been distributed and others will be sent out on application.

(2) *Heeria elegans.* I wish to call attention once more to *Heeria elegans*, or, as we should now call it, *Schizocentron elegans.* As I have stated before, *Heeria elegans* is not congeneric with the other so-called species of Heeria, and since it is the type of the genus the other species must be taken up under the name Heterocentron.[a] This species was in flower for nearly two months in Washington during the summer of 1904. It makes a good carpet plant, growing as well in the shade as in the sunlight. Living material can be sent to a limited number of growers who wish to experiment with it.

The drawings for plate 63 were made by Dr. Theodor Holm. Plates 66, 69, 71, and 72, and figure 14 were drawn by Miss Anna Snyder; figures 17, 18, and 19 were made by Miss Juliet C. Patten, from tracings by Miss Smith, of London. The remaining drawings, plates 64, 65, 67, 68, 70, were made by the late Frederick A. Walpole. The illustrations, with the exception of figure 14, represent new species and are made from the type sheets. That there may be no confusion as to the specimens used, all necessary data regarding them are brought together in the following table:

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[a] For full description of the species and reasons for change of name see p. 326.

Data concerning specimens used for illustrations.

Plate.	Name of species.	Locality.	Collector.	No.	Date.	Herbarium No.
LXIII	*Carex peucophila*	Popocatepetl, Mexico.	Rose and Hay ..	6994	1901	395788
LXIV	*Ornithocarpa fimbriata*.....	Constancian, Jalisco .	Pringle.........	8654	1902	396774
LXV	*Synthlipsis lepidota*	Tula, Hidalgo........	Pringle.........	6899	1898	396772
LXVI	*Ribes rugosum*.............	Santa Fe, Valley of Mexico.	Pringle.........	6999	1899	461280
LXVII	*Kosteletzkya malvariscana* .	Los Cuevas, Mexico ..	Hartman.......	105	1894	306138
LXVIII	*Kosteletzkya violacea*.......	Jojutla, Morelos......	Pringle.........	8663	1902	396718
LXIX	*Taonabo oocarpa*	Near Ocuilapa, Guerrero.	Nelson	2994	1895	234474
LXX	*Begonia unifolia*...........	Jojutla, Morelos......	Pringle.........	8690	1902	396783
LXXI	*Conostegia minutiflora*	Plunia, Oaxaca	Nelson	2493	1895	347475
LXXII	*Monochaetum pringlei*	Sierra de Tepoxlan, Morelos.	Nelson	8359	1890	371918
Fig. 14	*Taonabo sylvatica*..........	San Miguel Sollado, Vera Cruz.	Pringle.........	8169	1899	342858
16	*Eryngium grande*	Nevada de Toluca....	Rose and Painter.	7938	1903	451556
17	*Eryngium painteri*.........	Sierra de Pachuca, Hidalgo.	Rose and Painter.	6723	1903	450279
18	*Eryngium piluarioides*	Hidalgo	Pringle.........	8948	1904	469281
19	*Eryngium pringlei*.........	State of San Luis Potosi.	Pringle.........	3759	1891	461279

POACEAE.

SOME GRASSES FROM POPOCATEPETL.

In 1901 I made two trips to Popocatepetl, which lies on the southeastern rim of the mountains bordering the Valley of Mexico. On August 8 and 9 I made my first trip, spending one night at the timber line and going the next day up to the base of the snow cap, which was then at about 14,600 feet. On August 21 I made a second trip, confining my labors to the base of the mountain and not going higher than about 10,000 feet. During the trip I collected among many other things 15 species of grasses, which have been named by Mr. Elmer D. Merrill, formerly connected with the United States Department of Agriculture, but now botanist in the government laboratories of the Philippine Islands. I wish to call especial attention to two or three of these grasses, as they are of considerable interest.

Sporobolus wolfii, a species heretofore only known from one station in Colorado, was found on Popocatepetl just below timber line growing under pine trees (*Pinus hartwegiana*). This is one of the smallest of the grasses, never over 4 cm. high and sometimes so small that it has to be taken up on the blade of a penknife.

Trisetum rosei, here described as new, holds the distinction of growing at a higher altitude than any other flowering plant on the North American continent except *Festuca livida*. In fact I found it at 13,500 feet, the exact altitude at which *F. livida* had been reported from Mount Orizaba, where Linden speaks of it as the "last phænogamous plant." *Festuca livida* was also found on Popocatepetl, my highest point being 13,600 feet. These two species were found together at about 13,400 feet, and it is doubtless a mere question of chance which of them is found at the highest point. Both grow in and under the melting snow, pushing up along the tongues of exposed sand soon to be buried under a fresh fall of snow.

The following critical notes and descriptions were furnished by Mr. Merrill:

Stipa mucronata H. B. K. Nov. Gen. & Sp. Pl. **1**: 125. 1815.

Collected at an altitude of 3,390 meters, August 7 and 8, 1901 (no. 6035).

Muhlenbergia quadridentata (H. B. K.) Trin. Uniflor. 194. 1824.

Podosaemum quadridentatum H. B. K. Nov. Gen. & Sp. Pl. **1**: 130. *pl.* 682. 1815.

Collected at an altitude of 3,000 meters, August 22, 1901 (no. 6261).

Sporobolus wolfii Vasey, Bull. Torr. Bot. Club. **10**: 52. 1883.

Vilfa minima Vasey in Monthly Rept. U. S. Dept. Agr. March 155. 1874; U. S. Geog. Surv. W. 100th Merid. **6**: 282. *pl.* 27. *f.* 7–9. 1878, non Trin.

Collected at an altitude of 3,600 meters, August 7 and 8, 1901 (no. 6014).

This is a very remarkable species, not only in its minute size but also in its distribution. The only locality previously known is Twin Lakes, Colorado, where it was collected on sandy shores (no. 1077, John Wolf, 1873). There is also a specimen in the United States National Herbarium from the same locality collected by C. W. Derry in 1875. The specimen from Popocatepetl matches Vasey's type even to the most minute characters, and we do not hesitate in pronouncing them to be identical. That this species should be found in only two stations and so far apart as Twin Lakes, Colorado, and Mount Popocatepetl, Mexico, is certainly remarkable, although it is very probable that it occurs at intermediate points,[a] but has been overlooked by collectors, owing to its diminutive size. It has been suggested that *Sporobolus wolfii* is only a depauperate form of *S. filiformis* (Thurb.) Vasey, but the great disparity in size between the two and the much smaller spikelets of the former lead us to believe that it is a valid species.

Cinna poaeformis (H. B. K.) Scribn. & Merrill, U. S. Dept. Agr. Div. Agros. Bull. **24**: 31. 1901.

Deyeuxia poaeformis H. B. K. Nov. Gen. & Sp. Pl. **1**: 146. 1815.

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[a] Collected in 1903 by J. N. Rose and Jos. H. Painter on Nevada de Toluca (no. 6433) and at Cima, State of Mexico (no. 8062).

Poa subuniflora Kunth, Rev. Gram. **1**: 115, 339. *pl. 83.* 1830.

Cinnastrum poaeforme Fourn. Mex. Pl. **2**: 91. 1881.

Collected at an altitude of 3,240 meters, August 7 and 8, 1901 (no. 6025).

Agrostis tolucensis H. B. K. Nov. Gen. & Sp. **1**: 135. 1819.

Agraulus mexicanus Presl, Rel. Haenk. **1**: 236. 1830.

Collected at an altitude of 3,240 meters, August 22, 1901 (no. 6296a).

Calamagrostis tolucensis (H. B. K.) Trin. in Steud. Nom. II, **1**: 250. 1840.

Deyeuxia tolucensis H. B. K. Nov. Gen. & Sp. Pl. **1**: 148. 1815.

Calamagrostis sesquitriflora Steud. l. c.

Collected at an altitude of 3,940 and 3,580 meters, August 22, 1901 (nos. 6298 and 6298a).

Trisetum tolucense (H. B. K.) Kunth, Rev. Gram. **1**: 101. 297. *pl. 60.* 1830.

Avena tolucensis H. B. K. Nov. Gen. & Sp. Pl. **1**: 148. 1815.

Collected at an altitude of 3,550 meters, August 22, 1901 (no. 6299).

Trisetum rosei Scribn. & Merrill sp. nov.

A densely tufted, nearly glabrous, green or purplish perennial, 20 to 45 cm. high, with numerous firm leaves, dense spike-like panicles, and very strongly pilose flowering glumes; culms rather stout, densely puberulent above; sheaths exceeding the internodes, overlapping, minutely puberulent; ligule about 2 mm. long, truncate; leaf-blades plane or becoming involute in drying, glabrous beneath, prominently striate and minutely pubescent above, those of the culm one or two, 3 to 5 mm. wide, 5 to 7 cm. long, erect, the basal ones numerous, 5 to 12 cm. long; panicle purplish, 6 to 10 cm. long, 10 to 15 mm. in diameter, rather densely flowered, the branches 1 to 3 cm. long, appressed, flower-bearing throughout, the axils and branches densely and softly pubescent, spikelets about 6 mm. long, 2-flowered; empty glumes ovate-lanceolate, the first 4 mm., the second 5 mm. in length, glabrous, except on the ciliate margins above, with appressed or spreading white hairs, the first 5 mm., the second 4.5 mm. in length, ovate-lanceolate, acute and slightly cleft at the apex, bearing a slender, somewhat reflexed ciliate awn just above the middle, about 4 mm. in length; palea equaling the glume, hyaline, ovate-lanceolate, sparingly ciliate on the margins.

Collected by J. N. Rose on Mount Popocatepetl, at an altitude of 3,600 meters, August 7 and 8, 1901 (no. 6016, type); also Rose no. 5979, from the same locality but higher altitude (alt. 4,115 meters), is referred here, it being a lower, more cespitose form. This species is very similar in aspect to *Trisetum tolucense* (H. B. K.) Benth., but is at once distinguished from that species by its very strongly pilose flowering glume, ciliate awns, and puberulent sheaths and leaves.

Trisetum rosei tenerum Scribn. & Merrill, var. nov.

A slenderer form 20 to 40 cm. high, with long-exserted panicle, much shorter leaves, and smaller spikelets than in the species; culms very slender; culm leaves one or two, 2 to 3 cm. long, the basal ones very narrow, 5 to 7 cm. long; panicles densely flowered, 4 to 7 cm. long; spikes 4.5 to 5 mm. long, otherwise as in the species.

Collected by J. N. Rose on Mount Popocatepetl at an altitude of 3,160 meters, August 7 and 8, 1901 (no. 6016, type); also another specimen from the same locality without number, collected August 22, 1901, is referred here; also collected on Mount Orizaba, by J. N. Rose and Robert Hay, July 25, 26, 1901 (no. 6348).

Poa conglomerata Rupr. Bul. Acad. Brux. **9^2**: 235. 1842. nom. nud. ex Peyr. in Linnæa **30**: 8. 1859.

Collected at an altitude of 3,390 meters, August 7 and 8, 1901, by J. N. Rose (no. 6026a); also at the same station and date, altitude 3,540 meters (no. 6026).

Poa infirma H. B. K. Nov. Gen. & Sp. Pl. **1**: 158. 1815.

Collected at an altitude of 3,210 meters, August 22, 1901 (no. 6246).

This specimen is very small, none of the plants exceeding 7 cm. in height, but there is little doubt as to the identity of our plant with the form described by Kunth as *Poa infirma*, a species closely related to *Poa annua* L.

Festuca livida (H. B. K.) Willd. in Spreng. Syst. **1**: 253. 1825.

Bromus lividus H. B. K. Nov. Gen. & Sp. Pl. **1**: 150. *pl. 689.* 1815.

Schedonorus lividus R. & S. Syst. **2**: 707. 1817.

Festuca grandiflora Steud. Syn. Pl. Glum. **1**: 311. 1854.

Helleria livida Fourn. Mex. Pl. **2**: 129. 1881.

A very distinct and interesting species, badly figured by H. B. K., but finely illustrated by Hemsley.[a] The type of this species was collected on Mount Toluca. It is reported from Mount Orizaba, at an altitude of 13,000 to 13,500 feet, "the last phænogamous plant" (Linden), "the limits of vegetation" (Galeotti).

Collected at an altitude of 4,125 meters, August, 1901 (no. 5978).

Festuca amplissima Rupr. Bul. Acad. Brux. **9**²: 236. 1842, nom. nud. ex Fourn. Mex. Pl. **2**: 125. 1881.

Collected at an altitude of 2,970 meters, August 22, 1901 (no. 6262).

Festuca aequipaleata Fourn. Mex. Pl. **2**: 125. 1881.

Collected at an altitude of 3,575 meters, August 8, 1901 (no. 6297).

CYPERACEAE.

NOTES ON CAREX MADRENSIS AND THE CAREX PINETORUM OF LIEBMANN.

Carex madrensis Bailey, Bot. Gaz. **25**: 270. 1898.

Collected by J. N. Rose, August 16, 1897 (no. 2357), near the top of the Sierra Madre, in the extreme southern end of the State of Durango. No exact station can be given for the reason that it was found in the uninhabited parts of the mountains many miles from any town or village.

The original description of Dr. L. H. Bailey follows:

> One of the Indicae, and, with *C. schiedeana* Kunze, making a well-marked section of that group: slender, a foot to 18 inches high, with short and flattish leaves; spikes about four, aggregated, or the lowest one or two remote and long-peduncled from sheaths, a half inch long, and ovate or nearly globular, the apical staminate part very short; perigynium obovoid and slightly excurved, distinctly and abruptly beaked, the orifice slightly toothed, the body trigonous and strongly few-nerved, somewhat scarious, but not hairy or pubescent; scales broad and blunt, with a short cusp, brown, with a dorsal nerve, shorter than the light-colored perigynium.
>
> Differs from *C. schiedeana*, its nearest relative, in its much laxer habit and softer leaves, the absence of long bracts subtending the upper spikes, the more scattered spikes, the long peduncles of the lower spikes, the glabrous less-nerved perigynium, and the broader and blunter scales.

Carex peucophila Holm, nom. nov. PLATE LXIII.

Carex pinetorum Liebm. Vidensk. Selsk. Skr. V. **2**: 263. 1851, not Willd. Linnæa **10**: 265. 1836.

Collected by J. N. Rose, August 7 and 8, 1901 (no. 6994), on Mount Popocatepetl just below timber line under pines (*P. hartwegiana*), where it is quite common. The type of this species came from Mount Orizaba at about the altitude of my plants. It has heretofore been resting in *C. festiva* Dewey, a very different plant. This species has only been collected a few times, has never before been reported from Mount Popocatepetl, and has not heretofore been represented in the National Herbarium. The material was referred to Dr. Theodor Holm, who has prepared the accompanying note and illustration.

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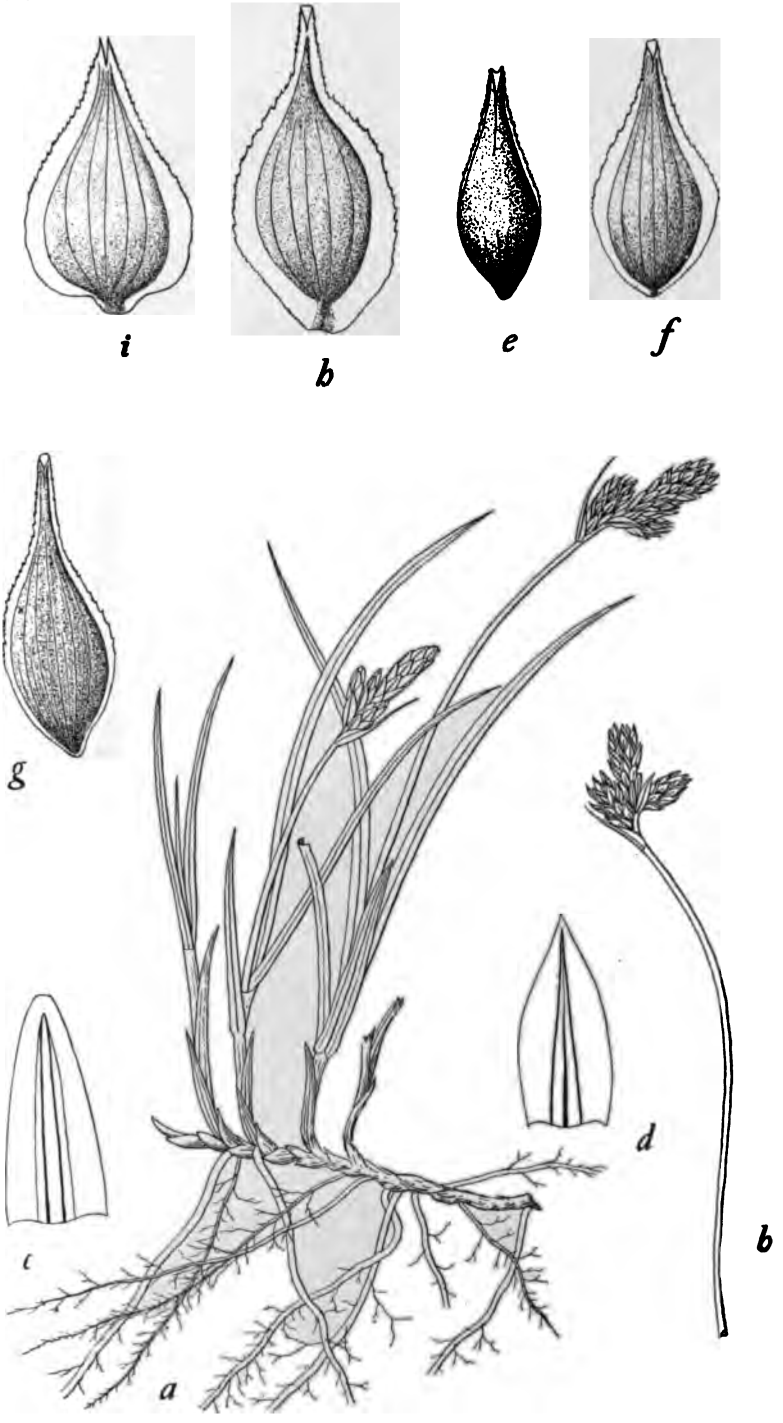
[a] Biol. Centr. Am. **3**: *pl. 102 b.*

PLATE LXIII.



CAREX PEUCOPHILA HOLM.

NOTE BY DR. HOLM.

Among the Mexican Cyperaceae collected and described by Liebmann in the Royal Danish Academy of Sciences (1851) is a species of Carex which he named *pinetorum* on account of its occurrence in pine woods. It was found on the volcano Orizaba at an altitude of about 12,000 feet. This species is also represented in Mr. Rose's collection from Popocatepetl, Mexico (1901), from the same elevation, and the specimens agree well with the diagnosis as drawn by Liebmann. It seems, however, as if the species has been somewhat misunderstood by various authors, hence I take the opportunity to call attention to some of its characteristics besides giving some data as to its supposed synonymy. Mr. Rose's specimens show a horizontally creeping rhizoma (fig. a) and the perigynia (fig. e) exhibit a narrow wing along the upper half of the margins besides a few faintly visible veins at the base, characters that have also been pointed out by Liebmann (l. c.), and by which it seems well distinguished from *C. orizabae* Liebm.

Nevertheless, our plant has been confused with *Carex festiva* Dew. and *C. straminea* Schk., besides having been considered identical with *C. orizabae* Liebm. The supposed synonymy may be summarized as follows:

Carex festiva Dew. forma *humilis* (Bockeler, Engler's Bot. Jahrb. **1**: 364. 1881).

Carex festiva Dew., *C. propinqua* Nees, *C. oreades* C. A. Mey. (Hemsley, Biol. Centr. Am. **3**: 473. 1885).

Carex straminea Willd. var. *australis* Bailey (Bailey, Mem. Torr. Club **1**: 23. 1889).

That our plant is distinct from *C. festiva* Dew. is readily to be seen from the horizontally creeping rhizome and the narrowly winged and faintly nerved perigynium. In *C. festiva* the rhizome is, as far as known, always cespitose and the perigynium prominently winged and nerved through the whole of its length, a structure which is very conspicuous not only in typical *C. festiva* (fig. f), but also in its varieties *haydeniana* (Olney) Boott (fig. g) and *decumbens* Holm (fig. h). It seems also very strange that *C. pinetorum* could be referred to *C. straminea*, of which the perigynium (fig. i) does not show the narrow, elliptical outline observable in *C. pinetorum*, but is broadly ovate, winged, conspicuously nerved, and bidentate at the apex, while in *C. pinetorum* the orifice of the beak is obliquely cut and only slit on the outer convex face.

Carex pinetorum Liebm. is no doubt a good species, but it is very unfortunate that Liebmann, as it seems, overlooked the fact that the name had been applied before by Willdenow to another species, which by Kunth is considered identical with Schkuhr's *Carex muhlenbergii*. If it, therefore, be deemed necessary to change the name proposed by Liebmann, I suggest *Carex peucophila*.

EXPLANATION OF PLATE LXIII.—Fig. *a*, entire plant; *b*, inflorescence of the same; *c*, scale of staminate spike of *C. peucophila*; *d*, scale of pistillate spike of the same; *e*, perigynium of the same; *f*, perigynium of *C. festiva* Dew.; *g*, perigynium of *C. festiva haydeniana* (Olney) Boott; *h*, perigynium of *C. festiva decumbens* Holm; *i*, perigynium of *C. straminea* Schkuhr. Figs. *a* and *b*, natural size; *c* to *i*, much magnified.

BETULACEAE.

NOTES ON OSTRYA,[a] WITH TWO NEW SPECIES.

Before 1888 only two species of Ostrya were known—one of them *O. ostrya* (*O. carpinifolia*) of the Old World, and the other *O. virginiana* of the new. Since then two species have been described—*O. knowltoni*, from Arizona, and *O. japonica*, from Japan. Our common *O. virginiana* ranges from Nova Scotia to eastern Texas. It has also been reported from South Mexico and Central America, but I have long been convinced that such a reference of the material from those regions is not correct. Mr. E. W. Nelson recently collected additional specimens from the State of Guerrero, which has enabled me to reexamine the Mexican material, and I now have no hesitancy in proposing it as a new species. In addition to this, Mr. Vernon Bailey has collected in the mountain gulches of western Texas a very peculiar species quite distinct from both *O. knowltoni* and *O. virginiana.*

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[a] The generic name can be clearly traced back to the Romans, among whom it was used by Pliny and others. Our present method of citing it would be as follows:
Ostrya (Micheli) Scop. Fl. Carn. 414. 1760.
Type species, *Carpinus ostrya* L. Sp. Pl. **2**: 998. 1753.

About the time I was submitting my manuscript for publication Herbert Winkler's handsome monograph of the Betulaceae appeared.[a] In this he recognizes only two species, *O. italica* and *O. knowltoni.* He reduces our common *O. virginiana* to a subspecies of the European species *O. italica*, and publishes as a new variety our Mexican and Central American forms. This treatment of *virginiana* I do not believe will be acceptable to American botanists. The Central Mexican form I had already taken up as a good species, naming it *O. mexicana*, while the Guatemalan material I had excluded from both *virginiana* and *mexicana.* I am still of this opinion, but must of course use Winkler's varietal name, though raising it to specific rank.

Ostrya guatemalensis (Winkler) Rose.

Ostrya italica guatemalensis Winkler in Engler, Pflanzenreich **19**: 22. 1904, in part.

I quite agree with Winkler that the Guatemalan material deserves a name, but I am convinced that it has nothing to do with *O. italica* and little with *O. virginiana*, to which it has usually been referred. It comes nearest to what I here describe as *O. mexicana*, but differs in having somewhat broader leaves, not so strongly nerved, and with denser, softer, more persistent pubescence. The bracts of the male catkins seem to be more pointed, etc.

The species has been reported several times from Guatemala and may be found in southern Mexico, but does not seem to go beyond the Isthmus of Tehuantepec.

Ostrya mexicana Rose, sp. nov.

A small tree, 12 to 15 meters high; bark of twigs one and two years old of a dull dark grayish brown color; twigs of the current season greenish brown and somewhat pubescent and bearing prominent brown lenticels, not at all glandular; petioles 5 to 10 mm. long; blade narrowly lanceolate, 5 to 10 cm. long by 2.5 to 4 cm. broad, sharply and somewhat doubly serrate, slightly cordate at base, acuminate but not abruptly so, with soft, rather scanty pubescence on both surfaces, beneath pale, dull, and strongly reticulated; fruiting spikes 4 to 5 cm. long.

Collected by E. W. Nelson at Omilteme, Guerrero, May 25, 1903 (no. 7050).

To this species also belong Botteri's Orizaba specimen (no. 284) and Pringle's no. 8188 from Jalapa, both of which have been referred to *O. virginiana.*

The only two Mexican localities given by Hemsley in the Biologia for *Ostrya virginiana* were Orizaba and Jalapa, from both of which I have seen specimens. This species is much more like *O. virginiana* than either *O. knowltoni* or *O. baileyi*, and Dr. Sargent's suggestion in the Sylva of North America that the Mexican and Central

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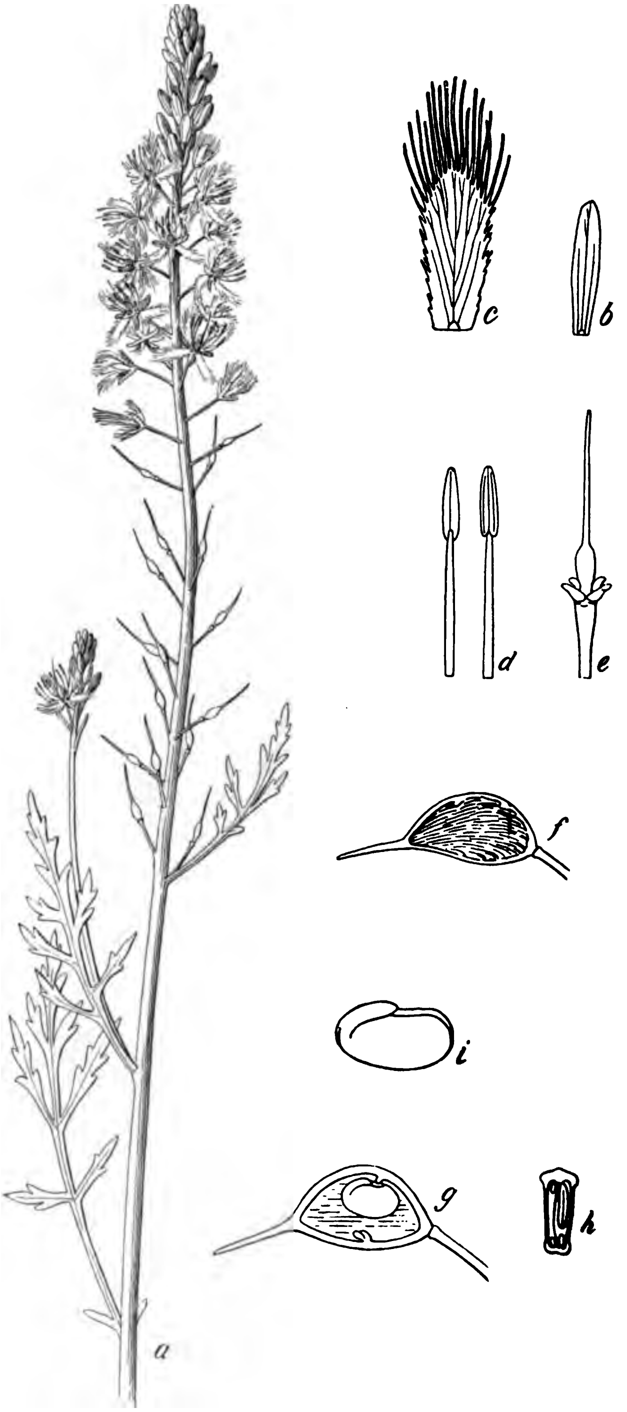
[a] Engler, Das Pflanzenreich, Heft 19, 1904.

PLATE LXIV.



ORNITHOCARPA FIMBRIATA ROSE.

American species may possibly be referred to *O. knowltoni* is not borne out by the specimens.

Ostrya baileyi Rose, sp. nov.

Tree 12 meters high with trunk 15 cm. in diameter; bark of twigs one or two years old dark grayish brown, those of the current season brown and pubescent with both glandular and simple hairs; petioles 2 to 5 mm. long, with pubescence like that of young branches; blade oblong, 4 to 5 cm. long, distinctly cordate at base, obtuse or acutish at apex, somewhat doubly and sharply serrate, pale beneath but not shining, somewhat softly pubescent on both surfaces; scales subtending the stamens acute.

Collected by Vernon Bailey in Guadalupe Mountains, Texas, August 19, 1901 (no. 435).

This species differs from *Ostrya virginiana* in the shape and toothing of the leaves, the more glandular branches and petioles, different tips to bracts of male flowers, etc. From *O. knowltoni* in the color of the bark of the one and two year old branches, the cordate base of the leaf blades, the thickly set stipitate glands on branches and petioles, the sharper teeth of the leaves, etc.

This species is somewhat intermediate in characters between *O. virginiana* and *O. knowltoni* and also occupies an intermediate geographical position. *O. virginiana's* western limit is eastern Texas, while *O. knowltoni* comes only from the Grand Canyon region of Arizona.

Mr. Bailey furnishes me the following statement regarding his specimens:

> The tree from which the type specimen was taken stands in the head of Dog Canyon on the west slope of the Guadalupe Mountains, Texas, about 2 miles south of the Texas and New Mexico line at approximately 2,160 meters altitude. It is in the lower end of the gulch half a mile east of the spring where the wagon road ends. Other trees of the species are fairly common in the shaded gulches of Dog and McKittrick canyons at from 2,100 to 2,530 meters altitude in transition zone, in company with yellow pines, Douglas spruce, oaks, and a maple.

BRASSICACEAE.

A NEW GENUS, ORNITHOCARPA.

Ornithocarpa gen. nov. PLATE LXIV.

Calyx rather long-cylindrical in bud; sepals narrowly oblong, obtuse, in anthesis spreading, purplish. Petals oblong, the upper part of margin fimbriate, the lower part lacerate or toothed, broad at base, white. Filaments filiform, elongated; anthers linear, oblong. Style much longer than the ovary, rigid, filiform, apiculate at apex; stigma minute, terminal. Ovary shortly stipitate, flattened parallel with the broad partition, 2-celled, each cell 2-ovuled. Ovules attached at the margin near the middle. Fruit obliquely ovate, the lower edge slightly rounded, the upper strongly so, indehiscent, wingless, crustaceous, tipped by a long beak-like persistent style; seed 1 (the other 3 ovules abortive). Cotyledons broad, accumbent.

Ornithocarpa fimbriata Rose sp. nov.

Stems simple or nearly so, 60 to 90 cm. high; racemes 10 to 30 cm. long; leaflets strongly toothed or cleft; style 6 mm. long; ovary and fruit glabrous.

An annual, glabrous, growing in shallow water. Leaves pinnate. Inflorescence an elongated raceme.

Collected by C. G. Pringle at Constancia Station, east of Guadalajara, Jalisco, August 19, 1902 (no. 8634).

EXPLANATION OF PLATE LXIV.—Fig. *a*, upper part of stem; *b*, sepal; *c*, petal; *d*, two views of stamen; *e*, ovary and disk; *f*, pod, *g*, section of pod showing ovules and seed, *h*, cross section of pod, *i*, seed with covering removed, showing cotyledons. Fig. *a*, natural size; *b* to *e*, scale 4, *f*, *g*, and *h*, scale 2, *i*, scale 4.

THREE SPECIES OF OLD GENERA.

Synthlipsis lepidota Rose, sp. nov. PLATE LXV.

Annual, 50 to 60 cm. broad, with many spreading stems from the base, glabrous except for the copious minute scales; basal leaves in a rosette, oblanceolate, 7 to 10 cm. long, obtuse, entire or with a somewhat undulating margin with or without a few teeth, on both sides clothed with closely set scales, tapering into a slender petiole; stem leaves shorter, often with distinct teeth or even lobes; racemes 10 to 15 cm. long; pedicels 8 to 12 mm. long; sepals oblong, covered without with minute scales, 4 mm. long; corolla pale yellow, in age becoming somewhat purplish, 7 mm. long; pods thin-walled, 12 to 14 mm. long, rounded at base and apex, covered with small scales, especially when young; style slender, 1.5 to 2 mm. long.

Collected by C. G. Pringle near Dublan, State of Hidalgo, July 13, 1898 (no. 6899).

EXPLANATION OF PLATE LXV.—Fig. *a*, one of the ascending branches; *b*, stellate scale from foliage; *c*, sepal; *d*, petal; *e*, stamen, two views; *f*, ovary; *g*, longitudinal section showing ovules; *h*, cross section of same; *i*, cotyledons and plumule. Fig. *a*, natural size; *b*, scale 40; *c* to *f* and *i*, scale 4; *g* and *h*, scale 1½.

Thelypodium pallidum Rose, sp. nov.

Biennial, tall (80 to 150 cm. high), more or less branched, glabrous and of a pale-green color; basal leaves 4 to 6 cm. long, lyrate, the terminal lobe rounded and obtuse, the other lobes very small, the petiole and under surface somewhat pubescent; stem leaves sessile and clasping, glabrous, the margin denticulate; inflorescence elongated, sometimes 50 cm. long; flowering pedicels spreading, in fruit a little ascending; sepals oblong, obtuse, purplish, 2.5 mm. long; petals narrow; anthers sagittate at base; receptacle swollen; stigma circular; ovary stipitate; pod ascending, 12 to 20 mm. long; seeds rugose.

Collected by J. N. Rose and Jos. H. Painter near Tres Marias, Morelos, September 21, 1903 (no. 7209).

Lepidium granulare Rose, sp. nov.

Slender, erect, annual or biennial, 40 cm. tall, more or less branched throughout, not at all pubescent, but somewhat granular; stem leaves pinnatifid, the lobes more or less lobed or sharply-toothed; upper leaves often linear and entire; racemes 5 to 8 cm. long, erect; pedicels ascending, 2.5 mm. long; sepals with scarious margins; stamens 2; fruit 2 mm. long, distinctly notched at apex, glabrous; style very short; seed with cotyledons incumbent.

Collected by C. G. Pringle in alkaline meadows, City of Mexico, June and July, 1901 (no 8488).

Nearest *L. sordidum* of north Mexico, but with 2 stamens instead of 4, less granular herbage, different fruit, etc.

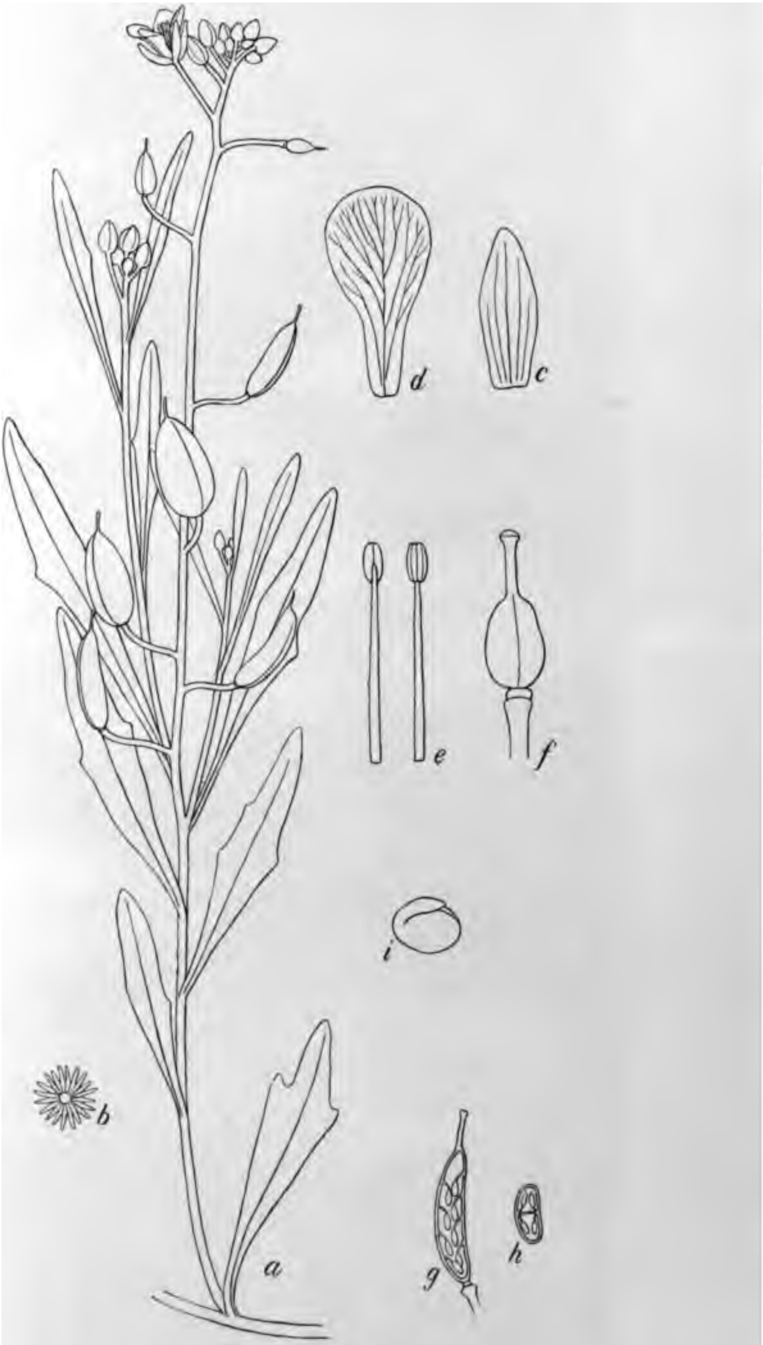
CRASSULACEAE.

TWO NEW SPECIES OF ECHEVERIA.

Echeveria multicaulis Rose, sp. nov.

Caulescent, the stem roughened below, naked, crowned near the top by a rosette of obovate or spatulate leaves, the whole plant including flowering branches 20 cm. high in cultivation but said to reach 90 to 120 cm. high in the wild state; leaves 3 to 4 cm. long, 12 to 20 mm. broad at widest point, flattened, mucronately tipped, glabrous, the margin and face more or less brightly colored; flowering branches bright-colored, bearing scattered oblanceolate leaves; inflorescence a short compact equilateral raceme; flowers subtended by small bright-colored bracts; pedicels very short but distinct; calyx lobes narrow, acute, ascending, about one-half as long as the corolla; corolla buds acute, angled; corolla reddish without, yellowish within.

Collected by E. W. Nelson and E. A. Goldman near Omilteme, State of Guerrero, May, 1903 (Rose's no. 628) and flowered in Washington, December, 1903.



SYNTHLIPSIS LEPIDOTA ROSE.

Echeveria walpoleana Rose, sp. nov.

Acaulescent or becoming in age shortly caulescent; leaves forming a dense rosette, at first pale green with reddish margins but becoming deeply tinged with red throughout, thickish, rounded on the back, boat-shaped above, sharply acute, 6 to 8 cm. long, 2 to 2.5 cm. broad, glabrous; flowering stem 30 to 40 cm. long, its leaves thickish, acute; inflorescence two-branched, each branch a secund raceme of 8 to 10 flowers; pedicels very short; sepals spreading, ovate, acute, green; corolla about 14 mm. long, deeply orange-colored, the lobes erect, very thick, triangular in cross section, acute; stamens about half the length of the corolla lobes and attached near the top of the corolla tube; carpels erect.

Collected by Dr. E. Palmer near Las Canoas, San Luis Potosi, November, 1903, and flowered in Washington in August, 1903 (Rose's no. 506, Walpole's drawing no. 116 ined.).

This species is named for the talented botanical artist Frederick A. Walpole, who died at Santa Barbara, Cal., May 11, 1904, at the age of 43. Mr. Walpole was not only an artist of great promise, but was no mean botanist. In 1896 he was appointed artist in the Department of Agriculture, where he was employed continuously until his death, excepting one year when he served as artist of this Division. He was a prodigious worker and had prepared more than 1,000 botanical drawings, most of which are unpublished. He had prepared for the writer 125 drawings, many of them in color, and about 200 lead-pencil sketches. Good examples of his work may be found in this publication, in the Proceedings of the Washington Academy of Sciences, and in the narrative of the Harriman Alaskan expedition.

GROSSULARIACEAE.

A SYNOPSIS OF THE MEXICAN SPECIES OF RIBES.[a]

No synopsis of the Mexican species of Ribes has ever been published, but a bare list was given by Mr. Hemsley in the Biologia in 1880. Only 6 species were mentioned, one of these being without specific name. Of these 5 named species 4 had been collected by Humboldt. In this list was not included the old *R. tortuosum* from Lower California. Since Mr. Hemsley's list appeared the following species have been published: *R. viburnifolium* Gray in 1882, *R. quercetorum* Greene in 1885, and *R. dugesii* Greenman in 1903. If to these we add the 7 species proposed here, we have a total of 16 species. Two of these, viz, *R. quercetorum* and *R. longiflorum*, are United States species extending just into the northern border of Mexico. The two Lower Californian species, *R. viburnifolium* and *R. tortuosum*, may yet be found in southern California, although it is doubtful. *R. nelsoni* and *R. ceriferum* should be looked for in the mountain ranges of southern Arizona. A species has been found in Costa Rica, but its identification is uncertain.

The facilities for preparing this synopsis have been the very best. I have had before me the largest series of Mexican Ribes ever brought together. In the National Herbarium we have 53 sheets, and in addition to these I have examined 29 sheets from the Gray Herbarium, including the types of *R. viburnifolium* and *R. dugesii*. I have also seen the type of *R. quercetorum* in Doctor Greene's herbarium and examined material of *R. tortuosum* from San Quintin, its type locality.

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[a] For an extension of this paper see p. 338.

KEY TO MEXICAN SPECIES OF RIBES.

Leaves thick, Viburnum-like; racemes several in the axils of the leaves; calyx with a prominent horizontal disk .... 1. *R. viburnifolium.*
Leaves thin, of the ordinary type; racemes solitary in the axils of the leaves; calyx tubular; disk wanting.
Stems more or less prickly.
Petioles about the length of the blades, pilose; blades strongly nerved; Central Mexican species .... 2. *R. microphyllum.*
Petioles more or less elongated, pubescent but not pilose; blades not strongly nerved; United States species ranging into Lower California..... 3. *R. quercetorum.*
Stems not at all prickly.
Flowers yellow; calyx tube much elongated.............. 4. *R. longiflorum.*
Flowers generally not yellow; calyx tube much shorter than the last.
Anthers not tipped with a depressed gland.
Calyx elongated; leaves glandular; fruit black....... 5. *R. nelsoni.*
Calyx short; leaves not glandular; fruit red....... 6. *R. tortuosum.*
Anthers tipped with a depressed gland.
Ovary glandular-pubescent.
Pedicels with scanty hairs; ovary very glandular .... 7. *R. pringlei.*
Pedicels with dense pubescence; ovary not very glandular.. 8. *R. neglectum.*
Ovary glabrous.
Calyx tube shorter than the lobes.
Lobes of leaves acute.
Leaves glabrous above, the margin with glandular hairs.......................... 8a. *R. orizabae.*
Leaves pubescent above, the margin without glandular hairs.
Bracts scattered on pedicels.... 9. *R. kunthii.*
Bracts at top of pedicels....... 9a. *R. affine.*
Lobes of leaves obtuse................. 10. *R. dugesii.*
Calyx tube longer than the lobes.
Young branches often very glandular-pubescent; leaves with long-stalked glands............ 11. *R. ciliatum.*
Young branches not glandular-pubescent; leaves eglandular or with a few short-stalked glands.
Leaves glabrous above, nearly so beneath .... 12. *R. ceriferum.*
Leaves pubescent on both sides, often densely so beneath.
Branches short and stout, becoming light brown, soon glabrate ..... 13. *R. rugosum.*
Branches elongated, slender, becoming a dark purple, puberulent......... 14. *R. grande.*

Ribes viburnifolium Gray, Proc. Am. Acad. **17**: 202. 1882.

Ribes viburnifolium differs from Ribes proper in having several racemes in a cluster, in the peculiar foliage, the rotate calyx, and the well-developed horizontal disk on which are borne the stamens and petals. It is confined chiefly to Lower California and its neighboring islands, but has been reported once from Sonora.

Ribes microphyllum H. B. K. Nov. Gen. & Sp. **6**: 62. 1823.

A bush, 1.5 to 3 meters high; bark of old wood nearly black, of first-year branches light-colored; spines stout, usually single; petioles slender, longer than the blade, softly pubescent; leaves somewhat pubescent, deeply 3-cleft, the lobes more or less toothed or cleft, the teeth obtuse; bracts broad and obtuse; calyx 10 to 12 mm. long.

This is the only gooseberry known in all Mexico proper and it has long been a desideratum in American herbaria. It was collected first by Humboldt and Bonpland on their journey through Mexico during the last part of the eighteenth century, but we now have four recent collections of it to report:

Mr. E. W. Nelson's no. 268 from Mount Orizaba collected March 18, 1894.

Mr. C. G. Pringle's no. 6303 (1896).

Mr. C. G. Pringle's no. 6788 (1898).

J. N. Rose's no. 5399, from Tlaupujahua, Michoacan, collected July 12, 1901.

The second and third collectings were made at the type locality, "El Guarda," Serrania de Ajusco, in the Federal District, where I have also seen the plant, but without obtaining specimens.

The type locality El Guarda is on the old wagon road running over the mountains from the City of Mexico to Cuernavaca, and was the place where the soldiers were stationed to guard the road. Here Humboldt probably spent the night, going down the next day to the City of Mexico.

Ribes quercetorum Greene, Bull. Cal. Acad. **1**: 83. 1885.

We have referred to *Ribes quercetorum* certain Lower Californian material collected by Mr. C. G. Pringle, heretofore passing as *R. leptanthum* var. Mr. Pringle's specimens differ from that species in having the bark on first-year shoots redder, in their being glabrous and shining, and in having slightly differently shaped leaves, longer peduncles, and less pubescent pedicels.

Ribes longiflorum Nutt. Bot. Reg. **2**: under *pl. 125.* 1816.

This currant was collected in northern Mexico in the State of Chihuahua by C. C. Parry and Charles Wright in 1851 and 1852 (no. 1093). Wright's material was distributed as *R. tenuiflorum,* but in the Mexican Boundary Report it is referred to *R. aureum* var. *tenuiflorum.* Mr. Hemsley in the Biologia refers it to true *R. aureum.* A careful examination of this material leads me to the conclusion that it is neither typical *R. longiflorum* nor *R. aureum.*

Ribes nelsoni Coville & Rose, sp. nov.

Shrub 1 to 2 meters high with strong vigorous branches; old branches grayish, glabrate but with yellow persistent sessile glands (as also found on both surfaces of the leaves, petioles, and bracts); young branches pubescent; leaves broadly ovate, 3.5 to 7 cm. broad, 3-lobed, the lobes acute, with a broad nearly truncate base, glabrous and shining above, paler and pubescent on the veins beneath, coarsely serrate; racemes somewhat drooping, shorter than the leaves, 6 to 10-flowered; bracts linear, longer than the pedicels; flowers "pale yellow"; calyx 10 mm. long, pubescent without; tube 4 mm. long; lobes narrowly oblong, 6 mm. long; petals oblong, obtuse, 3 mm. long, longer than the stamens; anthers not tipped with a depressed gland; ovary glabrous.

Collected by C. H. T. Townsend and C. M. Baker near Colonia Garcia, in the Sierra Madre of Chihuahua, May 30, 1899 (no. 2, type) and at the same station by E. W. Nelson, August 25, 1899 (no. 6132).

Closely related to *R. americanum* Mill. (*R. floridum* L'Hér.), but with yellow flowers, more pubescent calyx tube, etc.

Ribes tortuosum Benth. Bot. Voy. Sulph. 17. 1844.

Ribes palmeri Vasey & Rose, Proc. U. S. Nat. Mus. **11**: 529. 1898.

A bush 90 to 120 cm. high; young branches clothed with a short close pubescence; leaves orbicular, 1.5 to 3 cm. in diameter, slightly 5-lobed, lobes rounded, puberulent; racemes short, few-flowered; calyx tube 2 to 3 mm. long, slightly longer than the sepals; ovary glandular pubescent; fruit red, smooth.

Type locality: San Quintin, Lower California.

Specimens examined:

Lower California: San Quintin, Palmer, 1898 (no. 741); San Julia Canyon and Las Huevitas, Brandegee, 1889; Ensenada, Anthony, 1897 (no. 182).

Ribes pringlei Rose, sp. nov.

? *Ribes campanulatum* H. & B. in Roem. & Schult. Syst. **5**: 500. 1819, not Moench. 1794.

A bush 15 to 30 cm. high, unarmed; branches reddish, glabrous and shining; leaves small, 2 cm. long, 3-lobed, the lobes acute, doubly toothed, above becoming nearly glabrous but with some fine pubescence and more or less thickly studded with short glandular hairs; beneath pale, strongly nerved, becoming glabrate, but more or less thickly set with nearly sessile glands; petioles glandular and pubescent, broadened at base, shorter than the blade; racemes solitary in the axils, 2.5 to 5 cm. long, somewhat curved, bracteate; lower bracts more or less leaf-like, more or less glandular; pedicels 3 to 4 mm. long, jointed just below the flower; calyx glandular without, tubular, the tubes 8 mm. long, the lobes about 4 mm. long, acute or acuminate; petals much shorter than the lobes of the calyx, nearly as broad as long; stamens included; anthers glandular at tip; ovary glandular-pubescent; mature fruit not seen.

Collected by Mr. C. G. Pringle on the Sierra de Ajusco, altitude 3,000 meters, April 16, 1898 (no 6811, type); at the same station, J. N. Rose, June 18, 1901 (no. 5522), in the Valley of Mexico by C. G. Pringle, 1897 (no. 7210a); and by J. N. Rose and Jos. H. Painter near Eslava, Valley of Mexico, September 17, 1903 (no. 7122).

Ribes neglectum Rose, sp. nov.

A bush 120 to 150 cm. high, unarmed; branches dull, grayish; young branches bearing stalked glands and a short close pubescence; leaves nearly orbicular in outline, 3 to 5-lobed, the lobes obtuse, doubly toothed, paler beneath, the pubescence on the nerves of soft interspersed with gland-tipped hairs, slightly cordate at base with a broad open sinus; petiole with stiff gland-tipped hairs and soft pubescence; racemes 5 to 12-flowered, erect or ascending at first, drooping in fruit; bracts rather conspicuous, ovate, toothed or entire; pedicels 3 to 6 mm. long, bibracteolate at base of flower; flower 15 mm. long; ovary bearing some gland-tipped hairs, otherwise glabrous; calyx tube hairy without, slightly longer than the lobes; lobes broadly ovate, obtuse; petals broad, crenately toothed; fruit said to be black when ripe, edible.

Collected by Dr. Edward Palmer at Alvarez, near San Luis Potosi, September 5 to 10, 1902 (no. 113, type), also in 1904 (no. 190), and at the same place by Parry and Palmer 24 years before (no. 232). The latter specimen has since remained as an undetermined Ribes. Mr. Hemsley in the Biologia so listed it, associating it with Bourgeau's no. 302 taken up elsewhere in this paper as *R. rugosum*. The sheet in the Gray Herbarium of Parry and Palmer's no. 232 contains two specimens, the fruiting one being the above species, while the flowering one suggests *R. pringlei*; but whether it is that species or still another undescribed one is hard to determine with the material in hand.

Ribes ceriferum Coville & Rose, sp. nov.

A bush, 1 to 3 meters high; bark of old branches dark brown, of young branches light brown, the latter somewhat pubescent and more or less glandular; leaves orbicular in outline, 2 to 4 cm. in diameter, slightly 3-lobed, the lobes broad and usually rounded, pale and somewhat puberulent on the veins beneath, dark green, somewhat shining and nearly glabrous above, both surfaces abundantly provided with sessile exudating glands, somewhat doubly serrate, each tooth tipped by a large gland; raceme few-flowered (probably); calyx tube somewhat pubescent; anthers tipped by a depressed gland; fruiting pedicels 5 mm. long; fruit black, glabrous.

Collected by E. W. Nelson on Mount Mohinora, southwest Chihuahua, altitude 2,550 meters, September 1, 1898 (no. 4870). It was collected along with species of Zygadenus, Ligusticum, Washingtonia (Osmorrhiza), etc.

It is very unlike the other Mexican currants, being perhaps more closely related to the *R. viscosissimum* of the United States.

Ribes kunthii Berland. Mem. Soc. Phys. Genev. II. 3²: 60. 1826.

Ribes multiflorum H. B. K. Nov. Gen. & Sp. **6**: 60. 1823, not Willd. nor Kit.

Ribes mexicanum Spreng. Syst. **4**: Cur. Post. 100. 1827.

Ribes affine H. B. K. Nov. Gen. & Sp. **6**: 60. 1823.

A rather large spreading bush, 1 to 3 meters high, unarmed; leaves ovate in outline, extremely variable in size, either clustered near the top of stunted branches or single and distant, then larger, on the new branches; blade 1 to 5 cm. long, mostly 3-lobed, sometimes somewhat 5-lobed, usually acute but sometimes obtusish, slightly pubescent becoming nearly glabrate above, pale and somewhat pubescent especially along the veins beneath, doubly serrate; petioles slender; stipules ciliate-glandular; racemes usually drooping, 6 to 12-flowered; bracts pubescent and glandular, longer than the hairy pedicels; ovary glabrous; calyx tube 2 to 3 mm. long, slightly pubescent without; sepals somewhat longer than the tube (3 to 4 mm. long) somewhat purplish; petals minute (1.5 mm. long), nearly orbicular; fruit smooth, bluish black, small, rather dry.

Type collected "prope Moran" in the State of Hidalgo.

Specimens examined:

State of Hidalgo: Sierra de Pachuca, altitude 2,700 to 2,900 meters, C. G. Pringle, July 17, 1898 (no. 6904) and February 20, 1899 (no. 6996); J. N. Rose, July 21 and 22, 1901 (no. 5557).

Real del Monte, Rose and Hough, June 2, 1899 (no. 4482).

This species is nearest *R. rugosum* but has less pubescence, and has the leaves less rugose and more strongly and sharply lobed, the flowers smaller and purplish, and the sepals longer than the calyx tube.

Humboldt collected near Moran, near the City of Pachuca, Hidalgo, two species of Ribes which were described as *R. multiflorum* and *R. affine*. In 1899 and again in 1901 and 1903 I visited the mountains about Pachuca with the hope of re-collecting these two species. I found, however, but one species, which was quite common on the mountain ranges both on the east and west of Pachuca. This one shows considerable variation in its foliage and inflorescence and this led me at first to the conclusion that Humboldt had obtained but one species, which seemed confirmed by Kunth's own doubt as to whether he had more than one species before him. In spite of my failure to find a second species I am now inclined to believe that Humboldt had two distinct species.

Hemsley in the Biologia uses for them the names *R. multiflorum* and *R. affine*, while the Kew Index calls them *R. kunthii* and *R. campanulatum*. In the first couplet *R. multiflorum* is a homonym, as also *R. campanulatum* in the second, so that the proper names for these species, if there be two, are *R. kunthii* and *R. affine*, as above.

Ribes dugesii Greenman, Proc. Am. Acad. **39**: 78. 1903.

Type locality: Mountains of Santa Rosa near City of Guanajuata.

Ribes ciliatum H. & B. in Roem. & Schult. Syst. **5**: 500. 1819.

Ribes jorullense H. B. K. Nov. Gen. & Sp. **6**: 61. 1823.

Forming large bushes 3 to 5 meters high; stems 7 to 13 cm. in diameter; bark on old branches dark, on new branches light brown or sometimes reddish, softly pubescent and slightly glandular but on vigorous shoots bearing numerous stout glandular hairs; leaves either clustered at the ends of short spurs or scattered along the sterile shoots, somewhat variable in size, 2 to 8 cm. long by 3 to 9 cm. broad, 3 to 5-lobed, the lobes ovate, acute, doubly serrate, the upper surface somewhat glossy, glabrate or with some fine pubescence towards the base and with scattered glandular hairs, beneath very pale, rugose and more pubescent than above, deeply cordate at base; racemes rather short and compact, 4 to 8 cm. long, many-flowered, nodding; bracts large, longer than the pedicels, pubescent both with soft and glandular hairs; bractlets minute, deciduous; pedicels pilose, 4 to 7 mm. long; calyx 8 to 9 mm. long, greenish white, the lobes acute, shorter than the tube, softly pubescent without, persistent on the fruit; ovary and fruit smooth, the latter shining, rather dry.

Common on all the high mountains of Mexico ranging from 3,000 to 3,900 meters.

Specimens examined:

Orizaba: Rose and Hay, July 25 and 26, 1901 (no. 6375).
Ixtaccihuatl: C. A. Purpus, January, 1903 (no. 53).
Popocatepetl: Rose and Hay, August 7 and 8, 1901 (no. 6009).
Toluca: C. G. Pringle, September 6, 1892 (no. 4253); Rose and Painter, October 15, 1903 (no. 7934).
Tancitaro: E. W. Nelson, February 24, 1904 (no. 6896).
Colima: M. E. Jones, July 13, 1892 (no. 140).

Ribes rugosum Coville & Rose, sp. nov. PLATE LXVI.

A large bush, unarmed; leaves orbicular, 2.5 to 3.5 cm. in diameter, 3-lobed, the lobes obtuse, doubly crenate, above glabrous, beneath pale, somewhat rugose and pubescent; petioles shorter than the blade, pubescent; stipules broad, usually ciliate but nearly hidden by the large bud scales; racemes drooping, 7 to 12-flowered; bracts longer than the pedicels; ovary 2 mm. long, glabrous; calyx tube broad, 4 mm. long, pubescent without; sepals greenish, 2 to 3 mm. long, oblong, rounded and apiculate; petals nearly orbicular, scant 2 mm. long, narrowed at base into a short claw; style 2 or 3-lobed, scarcely exserted.

Collected by Bourgeau near Santa Fé in the Valley of Mexico in July, 1865–66 (no. 302) and at the same locality by Mr. C. G. Pringle, 1899 (no. 6999, type).

EXPLANATION OF PLATE LXVI.—Flowering branch, natural size.

Ribes orizabae Rose, sp. nov. For description see p. 339.
Ribes grande Rose, sp. nov. For description see p. 339.

MIMOSACEAE.

A NEW SPECIES AND A NEW NAME.

Neptunia microcarpa Rose, sp. nov.

A delicate plant with perennial and much branched base, glabrous and smooth except for a few glandular protuberances; stem 30 to 50 cm. long; leaves bright green, glabrous or sometimes with a few short hairs on rachis and leaflets; stipules at first green, becoming brown and scarious, broadly ovate, acuminate, 5 mm. long; pinnæ 3 pairs or occasionally 4; leaflets 7 to 13 pairs, linear-oblong, 4 to 5 mm. long, obtuse; peduncles slender 4 to 6 cm. long; heads globular, small, few-flowered; bracts subtending the flowers persistent, ovate, acuminate; calyx lobes small, slightly pubescent on the margin; corolla greenish; stamens 10, in the lower flowers petaloid; ovary glabrous; pod subsessile, orbicular to shortly oblong, .8 to 1.5 cm. long, 8 mm. broad, 2 to 4-seeded.

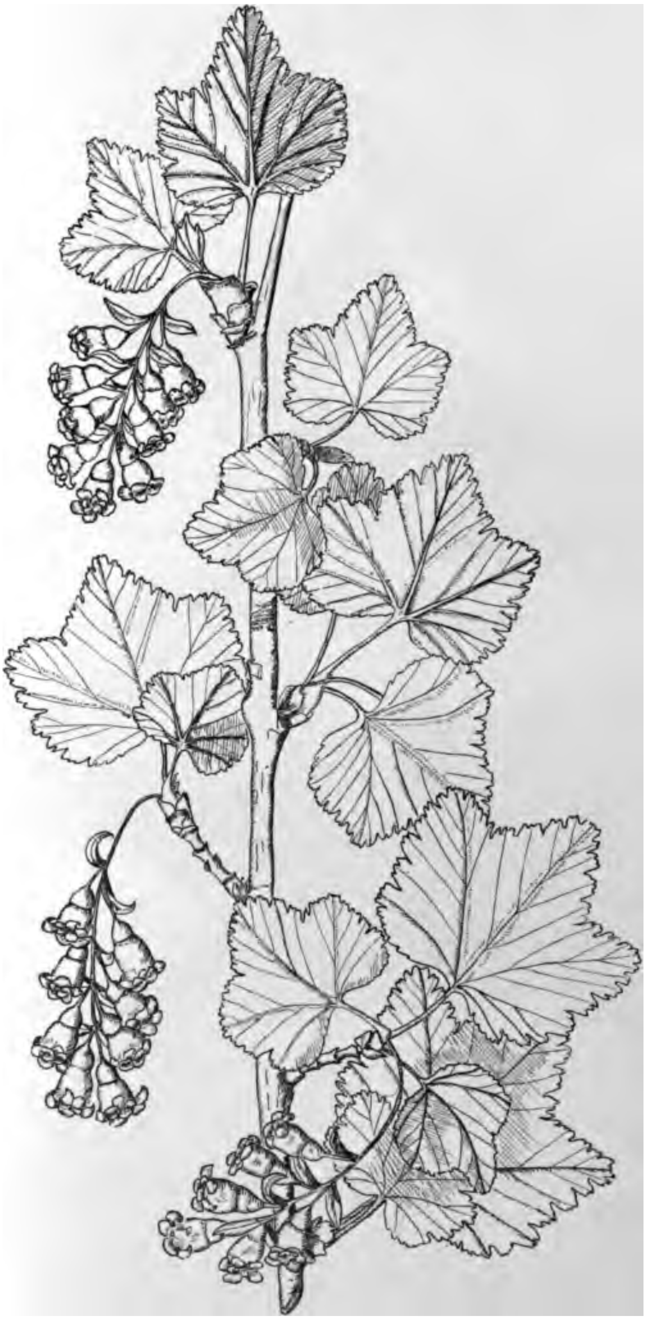
Collected by Mr. C. G. Pringle near Guadalajara, Jalisco in 1902 (no. 8826).

Very different from *N. lutea* in its pods, heads, and pubescence.

Acacia sericocarpa Rose.

Acacia ambigua Rose, Contr. Nat. Herb. **8**: 31. 1903, not Hoffmgg. 1826.

Miss Mary A. Day has called my attention to the fact that my *A. ambigua* is a homonym.



RIBES RUGOSUM COVILLE AND ROSE.

CAESALPINIACEAE.

THREE NEW SPECIES OF CERCIDIUM.[a]

Until recently only three species of Cercidium have been known from North America, viz, *C. floridum* Benth, *C. texanum* A. Gray, and *C. torreyana* S. Wats. In 1903 Micheli described *C. pleurifolia* from western Mexico and now I am adding three which have been discovered in our rich Mexican accessions.

Cercidium peninsulare Rose, sp. nov.

A low tree much branched at top; young branches very green and pubescent; spines short and stiff, solitary; leaves several from each axil, pubescent; pinnæ 1 pair; leaflets 2 or 3 pairs, oblong, rounded at base and apex, 10 to 12 mm. long; inflorescence 3 to 5-flowered; flowers yellow; ovary flattened, glabrous; pod 2.5 to 3.5 cm. long, 1 or 2-seeded, often constricted near the middle.

Collected by Dr. E. Palmer at La Paz, Lower California in 1890 (no. 112); at the same station by J. N. Rose, June 14, 1897 (no. 1320) and again by E. A. Goldman April, 1899 (no. 388, type); and by A. W. Anthony at San Jose del Cabo in 1897 (no. 363).

This species has been distributed both as *Parkinsonia microphylla* and as *P. torreyana*, but though we know little about it it seems quite distinct from either.

Cercidium goldmani Rose, sp. nov.

Tree 7 to 12 meters high, the bark somewhat greenish; infrastipular spines single, straight; leaves small; peduncle and rachis a little pubescent; pinnae 2 pairs; leaflets 3 to 5 pairs, oblong, 3 to 5 mm. long, glabrous on both sides; inflorescence a few-flowered raceme, the petiole and branches pubescent; flower-buds at first puberulent, soon glabrate; petals yellow; stamens very hairy below; ovary glabrous; pod oblong, 5 to 9 cm. long, acute, cuneate at base.

Collected by E. A. Goldman at San Geronimo, Oaxaca, February 14, 1904 (no. 735).

Cercidium unijuga Rose, sp. nov.

Tree 4.5 to 9 meters high with greenish bark; infrastipular spines single, short, straight, stiff; common petioles short (5 mm. or so long), pubescent; pinnæ 1 pair, divergent; leaflets 5 to 8 pairs, linear-oblong, 5 to 7 mm. long, obtuse or retuse, pubescent, soon glabrate above; inflorescence few-flowered, pubescent; flowers yellow, about 15 mm. broad; stamens hairy at base; pod flattened, linear-oblong, 3 to 6 cm. long, 8 mm. broad, rounded or obtuse at apex, narrowly wedge-shaped at base, hardly stipitate, glabrous, few-seeded.

Collected by E. W. Nelson, near Cuicatlan, Oaxaca, October 8 to 24, 1894 (no. 1696).

NEW NAME FOR A CASSIA.

Cassia holwayana Rose.

Cassia multiflora Mart. & Gal. Bull. Acad. Brux. 10^2: 305. 1843, not Schlecht. 1843, nor Vogel 1837.

This is a very beautiful flowering species with much larger flowers and fewer leaflets than the so called *C. biflora*.

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[a] Cercidium Tulasne, Arch. Mus. Par. 4: 133. 1844. Type species *C. spinosa* Tulasne, loc. cit. 134.

VICIACEAE.

THE PEDICELED SPECIES OF PAROSELA IN MEXICO.

The genus Dalea was first described by Linnæus in 1737, in his Hortus Cliffortianus and also in his Genera Plantarum of the same year. In his Species Plantarum of 1753 it was reduced to Psoralea, where it remained until revived by Jussieu in 1789 (although he included in it what we now know as Kuhnistera). It was again taken up by Ventenat in 1799, by Cramer in 1803, and by Willdenow also in 1803. The last author and date are usually quoted as authority and beginning of the restored Dalea.

If this were the full history of Dalea we should have little trouble, for the only question would then be as to authority and date of restoration.

In the meantime, however, two other authors used the name Dalea for other genera, viz, P. Brown in 1756 and Gaertner in 1788, on account of which, according to our usage regarding homonyms, the restored Dalea of Linnæus can not be used.

This is assuming that we begin our generic and specific nomenclature with 1753, which date has received the sanction of two influential bodies of American botanists the past year, which thus reaffirm the decision of the international botanical congress of 1892. If, however, we go back of 1753 for our starting point with genera, as some able botanists hold firmly that we ought to do and as in some cases there is good ground for doing, then the Dalea of Linnæus should still stand. The Berlin botanists hold to the name Dalea on the ground that it has been long in use. There is still a third way in which Dalea L. can be maintained and this purely on the principle of priority, viz, because Linnæus published Dalea as a homonym of *Psoralea dalea*. This technical ground might be resorted to for the preservation of the name were it not that a careful examination of other similar cases in Linnæus's Species Plantarum shows that many of our well-known genera would be thrown into confusion by a like procedure.

After a careful consideration of all the arguments both for and against Dalea, I have come to the conclusion that the name should be given up. This will require the use of Parosela of Cavanilles, which name has already been used by several American botanists.

For several years past I have been studying the Mexican species of Parosela and collecting a large amount of material, with the intention of presenting a synopsis of the genus at an early date. There has long been a feeling among botanists that this genus was badly in need of a revision. The late Mr. Walpole was preparing for me drawings of the foliage and of dissections of the flowers, and had already thus figured 167 species. Although there is a great amount of material on hand there are still a number of species which need to be more carefully studied, and for this reason I shall postpone for the present a full synopsis of the genus; but, owing to the fact that a number of new species have been distributed, especially by Mr. Pringle, and that others have proved to be the hosts of new fungi, I feel compelled to put out a partial synopsis of the genus.

The old genus Dalea has been divided into two subgenera. The larger one, Eudalea, is again easily divided into two groups, one having pediceled flowers and the other sessile ones. Below are presented practically all the known Mexican species of the first group, that is the Paroselas, with pediceled flowers. The species are arranged according to their relationships.

Parosela unifoliata (Rob. & Greenm.) Rose.

Dalea unifoliata Rob. & Greenm. Proc. Am. Acad. **29**: 383. 1894.

Parosela greenmaniana Rose, sp. nov.

Somewhat diffuse, slender, annual, glabrous, 30 to 40 cm. high; leaves normally with 3 leaflets; terminal leaflet much the largest, orbicular, 10 to 12 mm. in diameter, with glandular-dotted margin; racemes dense, spike-like, 2 to 4 cm. long; calyx tube a little over 1 mm. long, 10-angled, pubescent on the angles, the lobes ovate, shorter than the tube; petals purplish; keel and wings attached to the stamen tube near its middle; stamens 10; ovule one.

Collected by C. G. Pringle on dry soil at Las Sedas, Oaxaca, altitude 2400 meters, September 29, 1994 (no. 4924).

This species was distributed as *Dalea unifoliata*, but differs in the number of leaflets, small calyx, different calyx lobes, etc.

Parosela filiciformis (Rob. & Greenm.) Rose.

Dalea filiciformis Rob. & Greenm. Proc. Am. Acad. **29**: 382. 1894.

Parosela calycosa (A. Gray) Heller, Cat. N. A. Pl. ed. 2. 5. 1890.

Dalea calycosa A. Gray, Pl. Wright. **2**: 40. 1853.

Parosela frutescens (A. Gray) Vail, comb. nov.

Dalea frutescens A. Gray, Bost. Journ. Nat. Hist. **6**: 175. 1850.

Parosela spiciformis Rose, sp. nov.

Annual, 20 to 30 cm. high, erect and somewhat branching; stem and branches glabrous (at least below), purplish, glandular; leaflets 5 to 9, glabrous, oblong, 6 to 15 mm. long; rounded at apex, bearing small glands beneath, the margins crenulate; stipules setaceous; inflorescence a spike-like raceme 2 to 3 cm. long, terminal, on a slender peduncle (2 to 3 cm. long); bracts lanceolate, acuminate; calyx tube 1½ mm. long, strongly 10-angled, slightly hairy, glandular between the ribs; the lobes about as long as the calyx tube, green except the purplish tips.

Collected by C. G. Pringle near Iguala, Guerrero, October 3, 1900 (no. 9255).

Parosela vernicia Rose, sp. nov.

Annual, 60 to 90 cm. high, slender, glabrous; leaves sessile or nearly so, narrow; stipules setaceous; leaflets 21 to 41, narrowly oblong, 5 to 7 mm. long, glabrous on both sides, glandular-dotted beneath and especially on the margin, obtuse; peduncles slender, 5 to 8 cm. long; spike densely flowered, 1 to 3 cm. long; calyx tube covered with long glossy silky hairs, the tube 10-angled, 2 mm. long, the teeth unequal; corolla deep purple.

Collected by C. G. Pringle on lava fields near Yautepec, Morelos, October 26, 1902 (no. 868).

dular, clothed (as also
eading hairs; leaflets 11
mewhat glandular on the
minal; peduncle slender,
teeth ovate, acute, about
ow down on stamen tube.
of *Dalea canescens* by T. S.

s becoming glabrate, glandular;
obtuse, 3 to 4 mm. long, pubes-
long, on short peduncles; pedi-
hairy, the lower lobe a little longer
banner yellowish; stamens 10.
Choix, Sinaloa, October 17, 1898 (no.

Acad. **21**: 448. 1886.

glabrous and very glandular; leaflets 13 to
mm. long, bearing large glands beneath; gland-
uncles very short; racemes very dense and spike-
ort; bracts ovate, glabrous or slightly ciliate; calyx
labrous without, bearing one or two large glands
ry short and broad, hairy within; petals purplish;
low on the long-exserted stamen tube.
on chalky bluffs near Tula, Hidalgo, 1902 (no. 8723,
aca, November 1, 1894 (no. 5657); and by J. N. Rose
xquiac, Hidalgo, August 30, 1903 (no. 6623).
distributed as *Dalea nutans*, from which it must be quite

Vats.) Rose.
. Proc. Am. Acad. **17**: 341. 1882.

Benth.) Rose.
th. Bot. Sulph. 12. 1843.

se, sp. nov.
y procumbent, branched at base and with long slender stems,
to 20 pairs, glabrous, oblong, 4 mm. long, rounded or retuse at
r beneath; inflorescence a slender many-flowered, spike-like
e petiole 6 to 10 cm. long; bracts linear, shorter than the calyx;
ngly 10-angled, glabrous, glandular above; the lobes lanceolate,
than the tube, hairy on the inner face and margins; corolla violet.
. Palmer at Lodiego, Sinaloa, October 9 to 15, 1891 (no. 1624).
ly related to *P. anthonyi* of Lower California, but with glabrous
yx, etc. It differs from *P. palmeri* in its larger and glabrous

a (S. Wats.) Rose.
Wats. Proc. Am. Acad. **22**: 404. 1887.
as collected by Rose & Painter at Rio Blanco near Guadalajara,
no. 7495).

Moric.) Rose.
. Mem. Geneve **6**: 536. *pl. 6.* 1833.

Parosela delicata Rose, sp. nov.

Annual; stems erect, very delicate, somewhat branched, glabrous; leaves narrow; leaflets 7 to 15 pairs, minute (2 mm. long), narrowly oblong, glabrous, retuse; stipules minute; rachis slightly winged; racemes slender, axillary, 3 to 6 cm. long (including the petiole), 4 to 9-flowered; bracts ovate, glabrous, infolding the flower buds, glandular-dotted and glandular-serrate, caducous; pedicels short but distinct (1 mm. or less long); calyx strongly 5-angled, the angles cinerous-pubescent, the spaces between glabrous and bearing a few large brown glands, 5 mm. long, cleft to near the middle; lobes ovate, acute, serrulate; corolla purplish, the longer petals 7 mm. long.

Collected by C. G. Pringle on dry hills near Iguala, Guerrero, altitude 780 meters, September 14, 1900 (no. 8442).

A very delicate little plant suggesting *P. diffusa*, but with pubescent calyx, sepals, etc., and otherwise very different.

Parosela palmeri Rose, sp. nov.

Shrubby, about one meter high with long weak branches, glabrous or nearly so; leaflets about 25 pairs, oblong, 2 mm. long, retuse at apex, glabrous, somewhat glandular beneath; inflorescence an elongated loose-flowered raceme; rachis and bracts glabrous; calyx tube turbinate, strongly 10-angled, pubescent on the angles; corolla purplish.

Collected by Dr. E. Palmer near Alamos, Sonora, September, 1890 (no. 739).

This species was distributed as *Dalea parryi*, but although similar in some respects it is abundantly distinct.

Parosela neglecta (Robinson) Rose.

Dalea neglecta Robinson, Proc. Am. Acad. **29**: 329. 1894.

Parosela procumbens (DC.) Rose.

Dalea procumbens DC. Prod. **2**: 246. 1825.

Parosela holwayi Rose, sp. nov.

Probably biennial, but sometimes appearing as though perennial, diffuse and perhaps prostrate; branches many, slender, glabrous or slightly hairy towards the tips, purplish; leaflets 4 to 11 pairs, oblong, glabrous or nearly so, glandless; rachis slender, sometimes slightly pubescent; peduncles slender; flowers clustered near the top of the peduncle in a head-like cluster, but distinctly pediceled; calyx strongly 10-angled, hairy on the angles, bearing one row of glands between every two ribs; calyx lobes 1 mm. long, half as long as the tube, obtuse, green, ciliate; wings obtuse, violet-colored, 4 mm. long; keel violet-colored except a yellow patch on the lower side; both wings and keel attached to stamen tube a short distance above its base; banner small, mostly yellowish.

Collected by E. W. D. Holway near Iguala, Guerrero, November 3, 1903 (nos. 48, type, & 5139) and near Cuantla, Morelos, October 23, 1903 (no. 18).

This species is perhaps nearest *P. procumbens*, but certainly very distinct.

It gives me great pleasure to name this beautiful little Parosela for Mr. Holway, not only as a reminder of our association in Mexican work but also in recognition of his most unselfish devotion to botanical research.

Parosela chrysorrhiza (A. Gray) Rose.

Dalea chrysorrhiza A. Gray, Proc. Am. Acad. **5**: 156. 1861.

Parosela maritima (Brandegee) Rose.

Dalea maritima Brandegee, Proc. Cal. Acad. II. **2**: 125. 1891.

Parosela parryi (T. & G.) Heller, Cat. N. A. Pl. ed. 2. 6. 1900.

Dalea parryi T. & G. Proc. Am. Acad. **7**: 397. 1868.

Parosela peninsulare Rose.

Dalea canescens Benth. Bot. Sulph. 12. 1844, not Mart. & Gal. 1843.

Type locality: "Bay of Magdalena," Lower California.

Annual, diffuse, 20 to 25 cm. broad; stems somewhat glandular, clothed (as also the leaves, peduncle, calyx, bracts, etc.) with short white spreading hairs; leaflets 11 to 15, obovate-oblong, obtuse or retuse, 2 to 4 mm. long, somewhat glandular on the under surface; inflorescence a short spike-like raceme, terminal; peduncle slender, 1 to 15 cm. long; bracts lanceolate; calyx tube 2 mm. long; teeth ovate, acute, about the length of the calyx tube; keel and banner attached low down on stamen tube.

Described from specimens collected at type locality of *Dalea canescens* by T. S. Brandegee.

Parosela goldmani Rose, sp. nov.

Probably a perennial; branches with spreading hairs becoming glabrate, glandular; leaves slender; leaflets 15 to 18 pairs, shortly oblong, obtuse, 3 to 4 mm. long, pubescent on both sides; racemes spike-like, 2 to 4 cm. long, on short peduncles; pedicels short, subtended by narrow bracts; calyx hairy, the lower lobe a little longer than the other four; wings and keel purplish, banner yellowish; stamens 10.

Collected by E. A. Goldman on Sierra de Choix, Sinaloa, October 17, 1898 (no. 267).

Parosela viridiflora (S. Wats.) Rose.

Dalea viridiflora S. Wats. Proc. Am. Acad. **21**: 448. 1886.

Parosela lasiostoma Rose, sp. nov.

Annual with long prostrate branches, glabrous and very glandular; leaflets 13 to 25, glabrous, obtuse or retuse, 2 to 5 mm. long, bearing large glands beneath; glandless above; stipules setaceous; peduncles very short; racemes very dense and spike-like; pedicels distinct but very short; bracts ovate, glabrous or slightly ciliate; calyx 2 to 2.5 mm. long, 10-nerved, glabrous without, bearing one or two large glands between the ribs; the teeth very short and broad, hairy within; petals purplish; wings and keel attached rather low on the long-exserted stamen tube.

Collected by C. G. Pringle on chalky bluffs near Tula, Hidalgo, 1902 (no. 8723, type) and at Cieneguilla, Oaxaca, November 1, 1894 (no. 5657); and by J. N. Rose and Jos. H. Painter at Tequixquiac, Hidalgo, August 30, 1903 (no. 6623).

The Oaxaca specimen was distributed as *Dalea nutans*, from which it must be quite different.

Parosela radicans (S. Wats.) Rose.

Dalea radicans S. Wats. Proc. Am. Acad. **17**: 341. 1882.

Parosela divaricata (Benth.) Rose.

Dalea divaricata Benth. Bot. Sulph. 12. 1843.

Parosela minor Rose, sp. nov.

Perennial, probably procumbent, branched at base and with long slender stems, glabrous; leaflets 10 to 20 pairs, glabrous, oblong, 4 mm. long, rounded or retuse at apex, thin, glandular beneath; inflorescence a slender many-flowered, spike-like raceme, including the petiole 6 to 10 cm. long; bracts linear, shorter than the calyx; calyx turbinate, strongly 10-angled, glabrous, glandular above; the lobes lanceolate, acute, a little shorter than the tube, hairy on the inner face and margins; corolla violet.

Collected by Dr. E. Palmer at Lodiego, Sinaloa, October 9 to 15, 1891 (no. 1624).

Perhaps most closely related to *P. anthonyi* of Lower California, but with glabrous leaves, different calyx, etc. It differs from *P. palmeri* in its larger and glabrous calyx tube, etc.

Parosela gracillima (S. Wats.) Rose.

Dalea gracillima S. Wats. Proc. Am. Acad. **22**: 404. 1887.

This rare species was collected by Rose & Painter at Rio Blanco near Guadalajara, September 30, 1903 (no. 7495).

Parosela diffusa (Moric.) Rose.

Dalea diffusa Moric. Mem. Geneve **6**: 536. *pl. 6*. 1833.

Under the name of *Dalea diffusa* have been aggregated many of the species with pediceled flowers, including such very distinct types as *D. nutans*, *D. submontana*, etc. I have examined much herbarium material labeled *D. diffusa*, but very little if any of it seems typical. With Moricand's good figure as a guide this species ought some time to be clearly made out.

Parosela nutans (Cav.) Rose.

Psoralea nutans Cav. Ic. **3**: 1. *pl. 201.* 1794.

Dalea nutans Willd. Sp. Pl **3**: 1339. 1801.

Parosela minutiflora Rose, sp. nov.

A delicate erect little annual, much branched, glabrous and somewhat glandular; leaflets 6 to 14 pairs, oblong to linear-oblong, 3 to 7 mm. long, truncate or retuse, glabrous, glandular on both sides especially at or near the margins; rachis winged between the leaflets; stipules scarious, filiform; inflorescence a small raceme of 2 or 3 flowers, pedicels very distinct; calyx including the lobes 2 mm. long, glabrous, angled, bearing large glands between the ribs; keel and wings borne near the middle of the stamen tube; stamens 10; style slender; ovary glandular.

Collected by Mr. C. G. Pringle near Yautepec, Morelos, 1902 (no. 8721).

A species of the so called *P. diffusa* group, but quite distinct from any known to the writer.

Parosela submontana Rose, sp. nov.

Herbaceous and probably an annual, about one meter high with long and slender branches, more or less purplish, glabrous; leaves slender; leaflets usually 15 to 20 pairs, sometimes fewer, glabrous, linear-oblong, the margin somewhat glandular; rachis not winged; inflorescence a broad leafy panicle of racemes; racemes elongated; somewhat rigid, 8 to 10 cm. long, many-flowered, pedicels very distinct; calyx tube glabrous, 2 to 2½ mm. long, its teeth ovate, acute, serrulate on the margins; corolla violet, 10 to 11 mm. long.

Collected by J. N. Rose near Plateado, Zacatecas, September 2, 1897 (no. 2744). Other specimens of this species have been seen in herbaria and the species is apparently common in the Sierra Madre of Northern Mexico.

The species is clearly of the *P. diffusa* and *P. nutans* type, but very distinct from either.

Parosela elongata Rose, sp. nov.

Perhaps a perennial but lower part of stem not seen; branches elongated, glabrous, purplish, glandular; leaflets 3 to 7 pairs, oblong, obtuse, 7 to 12 mm. long, glabrous, the margin bearing large glands and the under surface small ones; inflorescence an elongated stiff spike-like raceme, often 20 cm. long including the pedicel; panicles very distinct; calyx strongly 10-angled, glabrous, bearing a row of large glands between the ribs, its tube 1.5 mm. long; calyx teeth about as long as the tube, green, slightly serrulate; flowers purple; stamens 10.

Collected by Mr. C. G. Pringle at Jojutla, Morelos, August 30, 1902 (no. 11,365).

Parosela crenulata (Hook. & Arn.) Rose.

Dalea crenulata Hook. & Arn. Bot. Beech. 285. 1840.

D. crenulata, referred in Biologia Centrali-Americana and Kew Index to *D. nutans*, should be restored to specific rank. Hooker and Arnott have well characterized it, assigning to it a shrubby habit, purplish stems, short dense racemes, and few leaflets. To these may be added a terete leaf rachis and serrulate calyx lobes.

This species has been repeatedly collected in western Mexico in recent years.

A FASCICLE OF NEW LUPINES.

Lupinus compactiflorus Rose, sp. nov.

Perennial, simple, erect, 30 to 40 cm. high; pubescence of stems of two kinds, one of rather close short hairs, the other of long, more or less spreading hairs; leaflets 8 to 10, oblong, 2 to 3 cm. long, densely hairy beneath; stipules linear with pubescence like that of the stem; racemes subsessile, compact; bracts linear, much longer than the very short pedicels; calyx 2-lipped, the lower lip only a little longer than the upper; upper lip notched; keel not ciliate; fruit not seen.

Collected by J. N. Rose near Tultenango Canyon, State of Mexico, July 13, 1901 (no. 5430).

Lupinus geophilus Rose, sp. nov.

Perennial, the stems prostrate on the ground often forming a dense mat, densely pilose-pubescent; stipules small, united with the petiole for one-third their length, the free parts linear to narrowly lanceolate, green; petioles pilose; leaflets 7 or 8, glabrous above, slightly pilose beneath, 1 to 2 cm. long, obtuse; inflorescence a very short spike-like raceme, 10 cm. or less long, sessile or subsessile; bracts narrow, conspicuous in the young raceme, longer than the pedicels but not extending beyond the developed calyx; calyx pubescent, 2-lipped; upper lip 3 mm. long, deeply notched, lower lip entire, 6 mm. long; banner 10 to 12 mm. long; pods spreading, pubescent with long yellowish hairs.

Collected by J. N. Rose and Jos. H. Painter at Cima, in the State of Mexico, September 19, 1903 (no. 7160, type), and in the upper slopes of Nevada de Toluca, October 15 and 16, 1903 (nos. 7908, 7967, and 7969).

In habit very unlike any other species of central Mexico.

Lupinus chiapensis Rose, sp. nov.

Perennial, 120 to 180 cm. high, more or less branching, glabrous or at least glabrate below, with short, somewhat scanty appressed pubescence above; leaflets 4 to 7, oblong, 1.5 to 3.5 cm. long, obtuse, shortly mucronate, green and glabrous above, but with scanty appressed pubescence beneath; stipules small, free nearly to the base; racemes elongated, 10 to 20 cm. long; flowers subverticillate; bracts setaceous, small; pedicels short, 2 to 3 mm. long; calyx appressed-pubescent, 2-lipped; lower lip 4 mm. long, twice as long as the upper; upper lip short, 2-toothed; bractlets at base of calyx; pods narrowly oblong, 3 to 4 cm. long, in the immature state hairy.

Collected by E. W. Nelson near San Cristobal, Chiapas, September 18, 1895 (no. 3199).

Lupinus confusus Rose, sp. nov.

A low rather spreading plant, nearly glabrous; leaflets 6 to 8, linear, somewhat narrowed at base, obtuse, green and glabrate above, only slightly hairy beneath, 2.5 to 6 cm. long, at most 5 mm. wide; petioles elongated, longer than the leaflets; stipules small, united with the petiole for more than half their length, free parts setaceous; bracts narrowly lanceolate, long-acuminate, caducous; flowers in subverticillate racemes; calyx with scanty appressed pubescence, two-lipped; lower lip acute, entire, 5 mm. long, upper strongly 2-toothed, 4 mm. long; bractlets minute, borne at the mouth of the calyx; keel ciliate; pods narrow; 3 cm. long, 3 to 5-seeded, cuneate at base, acuminate.

Collected by C. G. Pringle in the Sierra Madre, State of Chihuahua, October 5, 1887 (no. 1205) and distributed as *L. ehrenbergii*. It differs considerably, however, from that species, especially in leaflets, pubescence, calyx, etc.

Lupinus giganteus Rose, sp. nov.

Perennial with tall branching stems with only scant appressed pubescence; stipules small, united with the petiole for half their length, the free parts setaceous; leaflets 6 to 8, oblong, green and slightly hairy above; racemes subsessile, elongated, 60 to 80 cm. high, many-flowered; pedicels slender, 1 cm. long, with 2 branchlets near the middle; bracts lanceolate, long-attenuate, much longer than the buds, early deciduous; calyx 2-lipped, both lips entire; lower lip narrow, 9 mm. long, strongly nerved; upper lip 6 to 7 mm. long, broad, acute; ovary densely pubescent; old pods nearly glabrous.

Collected by J. N. Rose and Jos. H. Painter at a siding on the Mexican National Railroad on the rim of the Valley of Mexico above Dos Rios, September 4, 1903 (no. 6813).

Lupinus glabrior (S. Wats.) Rose.

Lupinus montanus glabrior S. Wats. Proc. Am. Acad. **23**: 270. 1888.

Stems nearly glabrous; stipules longer and inflated, 4 to 5 cm. long, united with the petiole except at the tip; petioles slender, 10 to 12 cm. long; leaflets 12 to 14, lanceolate-linear, narrowed at base, acute, 8 to 10 cm. long, nearly glabrous; inflorescence slender-peduncled, 10 to 12 cm. long; bracts 10 to 15 mm. long, oblong, obtuse, thin; pods spreading, narrowly oblong, only slightly hairy in age, 5 cm. long.

Collected by C. G. Pringle on a cool wooded slope of the summit of the Sierra Madre, altitude 2,910 meters, Chihuahua, October 7, 1887 (no. 1206).

Lupinus grandis Rose, sp. nov.

Stems tall and branching, lanate-pubescent above, nearly glabrous below; leaflets 5, oblong, obtuse, 4 to 6 cm. long, 1 to 2 cm. broad, green and glabrous above, pale and slightly pubescent beneath; stipules minute, free nearly to the base; racemes subsessile, in specimens seen not over 10 cm. long even in fruit; bracts small, caducous; pedicels about 2 mm. long; calyx 2-lipped; upper lip entire, 2 mm. long; lower lip 4 to 5 mm. long; pods spreading, hairy.

Collected by J. N. Rose in the lower belts of the pine forest of Mount Popocatepetl, altitude 2,700 meters, August 22, 1901 (no. 6320).

Lupinus macranthus Rose, sp. nov.

Probably tall and branching; the branches, petals, and rachis clothed with a dense matted pubescence; stipules narrow; leaflets 7 to 9, oblanceolate, 3 to 6 cm. long, 10 to 14 mm. broad at widest point, more or less obtusish at apex, apiculate, pale on both sides; peduncle 10 cm. or more long; inflorescence 10 to 15 cm. long, the flowers arranged in distant verticillate clusters; pedicels 7 to 10 mm. long; bracts very narrow; calyx appressed-pubescent, strongly 2-lipped, the lower lip only a little longer than the upper, obtuse; upper lip slightly notched, 7 mm. long; bractlets at mouth of calyx 3 to 4 mm. long; keel glabrous; banner 15 mm. long.

Collected by E. W. Nelson near Reyes, Oaxaca, altitude 2,250 to 3,120 meters, October 17, 1894 (no. 1749).

Lupinus neglectus Rose, sp. nov.

Perennial, much branched; stems with pubescence of two kinds, one short and close, the other of long coarse hairs, somewhat spreading; stipules small, the free parts setaceous; leaflets 6 to 8, oblong to oblanceolate, bright green and slightly hairy above, paler and more hairy beneath; peduncle 10 or more cm. long; racemes rather open; pedicels short; calyx deeply 2-lipped; lower lip 5 mm. long; upper lip retuse, 3 mm. long; keel glabrous; pods oblong, hairy, spreading.

Collected by Dr. E. Palmer at Alvarez, State of San Luis Potosi, September 5 to 10, 1904 (no. 134) and in 1878 (no. 130½, type).

The latter number was distributed as Parry and Palmer's, but without specific name.

Lupinus nelsoni Rose, sp. nov.

Large coarse plants 120 to 180 cm. high, pubescent throughout; leaflets 12 to 15, lanceolate, acute, 8 to 12 cm. long, glabrous above, but with long soft hairs beneath; stipules sometimes 8 to 10 mm. long, the free parts long-acuminate; bracts long-acuminate, much longer than the flowers; pods narrow, in age glabrate.

Collected by E. W. Nelson on Cerro San Felipe, Oaxaca, in 1894 (no. 1145).

This species is near *L. montanus*, but has very different stipules, narrower pods, etc.

Lupinus persistens Rose, sp. nov.

Perennial, simple or sometimes developing short lateral branches, erect, about 40 cm. high, with a short appressed pubescence containing some longer hairs; leaflets

6 or 8, oblong, 3 to 5 cm. long, green or nearly glabrous above, pubescent beneath; stipules linear; raceme short-peduncled; bracts persistent even after the flowers have fallen; pedicels very short; calyx 2-lipped; the lips nearly equal, the upper one broad and barely notched.

Collected by J. N. Rose and Walter Hough on mountains above Real del Monte, Hidalgo, June 2, 1899 (no. 4476).

This species has the habit of *L. compactiflorus* Rose, but has different pubescence, more persistent bracts, etc.

Lupinus potosinus Rose, sp. nov.

Stems perhaps tall, branching, the branches ascending, slender, somewhat pubescent with upwardly appressed hairs; stipules small, the free tips linear; petioles slender, 3 to 5 cm. long; leaflets 6 to 9, oblong to broadly spatulate, 2 to 3.5 cm. long, obtuse, green and only slightly hairy above, pale and somewhat hairy beneath; inflorescence on a slender peduncle, 10 to 15 cm. long, rather open and the flowers somewhat verticillate; bracts ovate, acute; pedicels rather slender; calyx 2-lipped; the upper lip 2-toothed, erect, 3 mm. long; the lower lip spreading, entire; pods spreading, 3 cm. long; seeds mottled.

Collected by Dr. E. Palmer at Alvarez, State of San Luis Potosi, September 28 to October 3, 1902 (no. 191, type) and in 1878 (no. 130).

The latter number distributed as Parry and Palmer's no. 130 was mentioned by Mr. Hemsley in the Biologia as a doubtful *L. cytisoides.*

Lupinus pringlei Rose, sp. nov.

Perennial, erect, herbarium specimen 30 cm. long, but entire plant doubtless much taller; pubescence of two kinds, one of short soft somewhat matted hairs, the other of long silky spreading hairs; petioles slender, longer than the leaflets; stipules 1.5 to 2 cm. long, somewhat inflated at base, united with the petiole for about one-third its length, the free parts attenuate and spreading from the petiole; leaflets 6 to 8, oblanceolate, broadest just below the apex, acute, 3 to 5 cm. long, glabrous above, silky beneath; inflorescence short, loosely flowered; pedicels very short (1 to 2 mm. long); bracts setaceous, 8 to 10 mm. long; calyx 2-lipped; upper lip 5 mm. long, deeply notched; lower lip entire, 8 mm. long; pods ascending, hairy.

Collected by C. G. Pringle at Eslava, Valley of Mexico, May 21, 1901 (no. 9538, type) and by Bourgeau at San Angel, same valley, 1865–6 (no. 88).

Lupinus reflexus Rose, sp. nov.

Undoubtedly perennial and probably branching; branches closely pubescent and slightly pilose; stipules rather prominent, 2 cm. long, the free parts elongated; leaflets 7 to 9 oblong, 3 to 4 cm. long, mucronate, nearly glabrous above, hairy beneath; inflorescence at first a very dense subsessile raceme; bracts lanceolate, acuminate, strongly reflexed even among the flower buds, tardily deciduous; pedicels densely lanate; calyx deeply 2-lipped; the upper lip broad, slightly notched, 7 mm. long; lower lip narrower than the upper, 8 mm. long, entire; calyx tube bearing 2 bractlets near the base; keel slightly ciliate; pods hairy; seeds dark, mottled.

Collected by M. E. Jones on the Volcano of Colima, Jalisco, July 13, 1892 (no. 204).

Lupinus splendens Rose, sp. nov.

Perennial, tall and much branched, softly pubescent; petioles (of the upper leaves at least) shorter than the leaflets; stipules filiform, 10 to 12 mm. long; leaflets oblong, 2 to 4 cm. long, acute and apiculate, nearly glabrous above, silky-pubescent beneath; peduncles either wanting or 3 to 5 cm. long; racemes 10 to 15 cm. long, in fruit even longer; bracts very conspicuous in the bud, elongated, filiform; pedicels very pubescent; calyx strongly 2-lipped; lower lip 9 mm. long; upper lip rather broad, 6 mm. long, faintly retuse at apex; keel very slightly ciliate; pods 3 to 3.5 cm. long, yellowish-pubescent; seeds dark, mottled.

Apparently common on the high mountains bordering the Valley of Mexico, ranging from 3,000 to 3,600 meters in altitude.

Specimens examined:

Mexico: Mt. Popocatepetl, Rose and Hay's nos. 6305, 6318 (type), August 22, 1901.

Morelos: Mr. Holway's no. 5208 from near Amecameca, 1903; Rose and Painter's no. 7222, September 29, 1903, from El Parque.

Lupinus simulans Rose, sp. nov.

Stems low, branching, with short somewhat spreading pubescence, very scant below; leaflets 3 to 6, oblanceolate, 1 to 3 cm. long, obtuse, shortly mucronate, cuneate at base, green and with scanty long upwardly appressed hairs, paler and more hairy beneath; petioles shorter than the leaflets; stipules minute, on the upper leaves at least 1 to 3 mm. long; flowering racemes short, 5 to 10 cm. long, with few scattered flowers; bracts setaceous, 2 to 3 mm. long; pedicels 5 to 6 mm. long; calyx with scanty appressed pubescence, 2-lipped; lower lip a little longer than the upper, 7 to 8 mm. long, acute; upper lip 6 to 7 mm. long, 2-toothed at apex; keel ciliate; immature pods very hairy.

Collected by E. W. Nelson, 18 miles southwest of Oaxaca City, September, 1894, (no. 1357, type) and by Charles L. Smith on Sierra de Clavellinas, Oaxaca, October, 1894 (no. 330).

This species is quite unlike any of the other Mexican species. It very much resembles in habit *Crotalaria lupulina* H. B. K.

Lupinus vernicius Rose, sp. nov.

Perennial, 50 to 60 cm. high, softly pubescent and slightly pilose; stipules small, linear; leaflets 5 to 7, oblong, 2 to 4 cm. long, nearly glabrous above, a little hairy beneath; raceme very short-peduncled; flowers verticillate; verticels distant; bracts caducous, silky; pedicels 2 or 3 mm. long; calyx 2-lipped; upper lip 3 mm. long, retuse; lower lip entire, 6 to 7 mm. long; keel ciliate; pods ascending, silky.

Collected by J. N. Rose and Jos. H. Painter on side of barranca above Santa Fé, Valley of Mexico, August 22, 1902 (no. 6509).

FOUR NEW SPECIES OF INDIGOFERA.

Indigofera micheliana Rose, sp. nov.

Stems herbaceous; leaflets 15 to 17, opposite, oblong, rounded at apex and cuspidate, somewhat cuneate at base, appressed-pubescent on both sides, 10 to 20 mm. long; racemes shorter than the leaves; pods reflexed, straight, 10 to 12 mm. long, flattened, pubescent, few-seeded.

Collected by Enrique Th. Heyde in Guatemala, 1892 (no. 198), and perhaps also no. 3755 of Heyde & Lux as distributed by Capt. John Donnell Smith. This latter plant Micheli states is probably new, but he does not describe it on account of the poor quality of his material.

Indigofera jaliscensis Rose, sp. nov.

Probably shrubby; branches channelled, clothed with an appressed whitish pubescence; leaflets about 21, oblong, rounded at base and apex, appressed-pubescent on both sides, 8 to 15 mm. long, mucronate; stipules filiform, 4 to 6 mm. long; leaf rachis strongly channelled; racemes much elongated, 20 cm. long, much longer than the leaves; flowers not seen; fruit small, spherical, one-seeded.

Collected by Dr. E. Palmer near Rio Blanco, State of Jalisco, 1896 (no. 596), and distributed as *I. sphaerocarpa*, from which it differs in having the leaflets more numerous, pubescent upon the upper surface, rounded and not cuneate at base, the racemes much more elongated, the fruit smaller, etc.

Indigofera conzattii Rose, sp. nov.

Low shrubby plant; branches covered with closely appressed hairs, some brown and some white; leaflets 4 to 8 pairs, opposite, pubescent on both sides, greener above, 10 to 15 mm. long, oblong, rounded and apiculate at apex, rounded or broadly cuneate at base; racemes usually shorter than the leaves, 3 to 4 cm. long, becoming sometimes 6 cm. in fruit; calyx campanulate, 1 mm. long, brownish-pubescent, its teeth minute; banner of corolla 6 mm. long, densely covered with brownish hairs; wings and keel glabrous, pinkish or light violet; pods whitish-pubescent, reflexed, 2 to 2.5 cm. long, slightly flattened.

Only known from Monte Alban near Oaxaca City, but here found by several collectors. Specimens have been distributed as *I. palmeri*, but it is certainly quite distinct.

Specimens examined:

> Oaxaca: Monte Alban, Rose and Hough, June, 1899 (no. 4583, type); Charles L. Smith, September 5, 1894 (no. 336); Lucius C. Smith, 1894 (no. 309); Conzatti and Gonzales, July and August, 1900 (no. 1027).

Named for my good friend Prof. C. Conzatti, who guided me to Monte Alban and who in many ways assisted me while in Oaxaca in 1899.

Indigofera montana Rose, sp. nov.

Herbaceous or perhaps shrubby at base, 60 to 120 cm. high; leaflets 21 to 31, opposite, oblong, 10 to 20 mm. long, obtuse or retuse, mucronate, more or less tapering at base, appressed-pubescent on both sides; racemes blackish-pubescent, elongated but shorter than the leaves; calyx broad, clothed with blackish appressed hairs, 5-toothed, 1 mm. high; teeth small, acute, shorter than the calyx tube, not thickened, the two upper ones widely separated, the 3 lower approximate; banner blackish-pubescent without, 4 mm. long, folded and somewhat hooded at top, sessile; keel retuse at apex; ovary curved, 3 or 4-ovuled, covered with blackish hairs; pods probably curved, those seen immature. Perhaps nearest *I. lindheimeri*, but with different pubescence, calyx, leaflets, etc. It is probably also found at higher altitudes.

Collected by J. N. Rose between Mesquitec and Monte Escobado, August 26, 1897 (no. 2607, type), near Monte Escobado, August 28 (no. 2666); and on mountain side in southern part of State of Durango, August 16 (no. 2339). Also by Dr. E. Palmer on the west side of "Iron mountain" near the City of Durango, 1896 (no. 703).

THREE NEW SPECIES OF PHASEOLUS.

Phaseolus (Leptospron) **cuernavacanus** Rose, sp. nov.

A tall climbing vine; stems slender with pubescence usually spreading; leaflets 3, ovate, 3 to 6 cm. long, acute at base, somewhat hairy on both surfaces; peduncles 7 to 12 cm. long, projecting above the leaves; flowers few, clustered near the top of the peduncle; pedicels very short; bractlets at base of calyx ovate to lanceolate; calyx tube broad; upper lip very broad and short; lower lip 3-lobed, the lobes equal, about as long as the calyx tube; banner broad, purplish, glabrous; wings 2 cm. long; immature pods slightly pubescent.

Collected by J. N. Rose and Jos. H. Painter on the border of the pedregal near Cuernavaca, Morelos, September 9, 1903 (no. 6911, type), and near the same place by C. G. Pringle, 1896 (no. 7214), 1900 (no. 9244), and September 9, 1903 (no. 11,864).

Phaseolus (Leptospron) **elongata** Rose, sp. nov.

A low vine climbing for 30 to 60 cm. or suberect, often much branched and slender, somewhat hirsute but often becoming glabrate; leaflets much elongated, oblong-linear, 4 to 10 cm. long, 5 to 10 mm. broad, rounded or even cordate at base, rounded but mucronate at apex, glabrous except for a few hairs on the margin and midrib, strongly reticulated; petioles more or less hirsute, much shorter than the leaflets; stipules ovate, many-nerved; peduncle elongated bearing a few flowers near the apex; flowers short-pediceled, jointed on to a receptacle-like protuberance; bracts subtending the flowers ovate, acute, 4 mm. long, strongly-nerved; calyx tube broad, somewhat hairy, 4 mm. high; the lower and two lateral lobes ovate, long-acuminate, 8 mm. long, the lateral lobes somewhat falcate, the upper lobe broad and retuse, much shorter than the others; corolla large, 2.5 cm. long, "dark purple;" ovary glabrous or nearly so, linear.

Specimens examined:

Oaxaca: Near Santo Domingo, altitude 480 meters, E. W. Nelson, June 18, 1895 (no. 2692), and Santa Efigenia, altitude 150 meters, E. W. Nelson, July 18, 1895 (no. 2848, type).

Phaseolus occidentalis Rose, sp. nov.

A high-climbing vine; branches becoming glabrate; leaflets broadly ovate to orbicular, 5 to 10 cm. long, round at base and apex, slightly hairy on both sides, prominently veined beneath; racemes including the peduncle elongated, often more than 3 dm. long, bearing mature pods, flowers, and young buds at the same time; pedicels short; bracts subtending the flowers ovate, obtuse, glabrous, nerved; calyx reticulated, nearly glabrous; calyx tube 4 mm. long; the lateral and lower sepals about the length of the tube, narrow; upper lobe broad and retuse; corolla violet, 2.5 cm. or more long, glabrous; pods 7 to 10 cm. long, narrow; seeds 6 mm. in diameter, tan-colored mottled with black.

Collected by J. N. Rose in canyons near the little town of Acaponeta, Territorio de Tepic, June 25, 1897 (no. 1468).

This species differs from the original description of *P. truxillensis* in the shape of the leaflets, and from all our named herbarium material, in its glabrous banner, in size and color of seeds, etc.

Palmer's no. 158 from Acapulco must be near this species, but the leaflets are often linear.

Frank Lamb's no. 499 is much nearer to it and, coming as it does from near the same locality, is probably to be definitely referred here. It was distributed as *P. speciosus.*

NEW SPECIES OF SEVERAL GENERA.

Aeschynomene pringlei Rose, sp. nov.

A slender shrub 2.5 to 3.5 meters high; bark of old branches nearly black and glabrous, of young branches light-colored and densely silky-pubescent; leaves narrow and elongated; stipules caducous, not seen even on flowering branches; leaflets 5 to 12 pairs, narrowly to broadly oblong, obtuse or rounded at apex but with a decided mucro, silky pubescent on both sides when young, glabrate above in age, paler and reticulated beneath; inflorescence paniculate, more or less leafy; branches few-flowered, pubescent; bracts at base of calyx orbicular, rounded at apex; calyx two-lipped, the upper lip retuse, the lower 3-lobed, the lateral lobes obtuse and shorter than the middle one; banner orbicular, purplish; stamens divided into two clusters of 5 each; ovary stipitate, clothed with long silky hairs; stipe slender, 5 to 7 mm. long; pods 2 or 3-jointed; joints oblong, 7 mm. long, pubescent, dull, slightly reticulated, the lower one curved at base, the other rounded.

Collected by C. G. Pringle at Jojutla, Morelos, August 30 and October 28, 1902 (no. 8709).

Cologania[a] **congesta** Rose, sp. nov.

Climbing vine; stems clothed with coarse brownish hairs, reflexed, but a little spreading; leaflets pale greenish yellow, broadly ovate, 4 to 5 cm. long, 2 to 3 cm. broad, obtuse but apiculate, with scanty rough hairs on both surfaces; perfect flowers 4 or 5 in axillary clusters; pedicels slender, 10 mm. long, hairy; bractlets at base of flowers linear; calyx tube 7 mm. long, covered with long spreading hairs, the lower lobe linear, elongated, the upper one retuse; female flowers also clustered; pods from female flowers straight, oblong, 3 to 4 cm. long, densely covered with long brown spreading hairs.

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[a] For a synopsis of the species see p. 34.

Type collected by J. N. Rose and Jos. H. Painter at Toluca, September 4, 1903 (no. 6778).

This species seems to be common in Central Mexico, as several specimens collected or seen by the writer in the Valley of Mexico and elsewhere seem referable here.

Crotalaria gracilenta Rose, sp. nov.

Perennial with frutescent base, much branched, 30 to 40 cm. high, pubescent; leaflets 3, linear to oblong-linear, 2 to 6 cm. long, 2 to 5 mm. broad, glabrous above, pubescent beneath; racemes 1 to 2 cm. long, rather few-flowered; pedicels slender, 5 to 6 cm. long, minutely bi-bracteolate near the middle; calyx 6 mm. long; banner 8 mm. long; wings 7 mm. long, oblong; keel strongly beaked; pods appressed-pubescent, stipitate.

Collected by J. N. Rose and Jos. H. Painter near Etzatlan, Jalisco, October 2, 1903 (no. 4570, type) and by C. G. Pringle, same station, October 23, 1903 (no. 11893).

Close to *C. tenuissima*, but leaves not nearly so attenuate, flowers smaller, pubescence of pedicels and calyx softer, racemes laxer, etc.

Harpelyce[a] **goldmani** Rose, sp. nov.

Probably a low shrub; bark of second-year twigs light-colored, glabrous; young branches densely pubescent; stipules linear, caducous; leaflets opposite, 5 to 9 pairs and an odd one, oblong, obtuse, glabrous above, densely pubescent and glandular beneath; inflorescence dense-flowered, 10 cm. or more long, the short peduncle and rachis densely pubescent with short brown spreading hairs; calyx deeply 2-lipped, densely reddish-pubescent; young pods and long styles glabrous.

Collected by E. A. Goldman at Canjob, Chiapas, March 27, 1904 (no. 787).

This species is near *H. pringlei*, but the leaflets, even the very youngest, are glabrous.

Rhynchosia cuernavacana Rose.

Rhynchosia australis Rose, Contr. Nat. Herb. **8**: 48. 1903, not Benth. 1864.

Willardia parviflora Rose, sp. nov.

Small shrubs, 3 to 4 meters high, much branched; stipules broadly ovate, minute (1 mm. or less long), caducous; leaves when young densely pubescent, in age glabrate above, slightly pubescent, beneath, 5 to 10 pairs, oblong, 8 to 16 mm. long, rounded at apex, thickish, the margin revolute; flowers borne in slender racemes, usually appearing before the leaves; racemes at first clustered in the axils of old leaf scars but really borne on the young branches and in age somewhat separated; pedicels short, bracteate; calyx pubescent, broadly tubular, short (2 mm. long), the three lower teeth small, approximate, the dorsal lobe broad, truncate or barely retuse; flowers 6 to 7 mm. long; banner orbicular, retuse; keel broad; stamens 10, united almost to the apex into a closed tube; ventral stamen free at base; ovary and style glabrous, the latter hooked; pods very flat, oblong to elliptical, cuneate at base, generally acute at apex, 3 to 7 cm. long, 1 or 2-seeded, tardily dehiscing; valves thin, with no internal partitions; seed 11 mm. broad, kidney-shaped.

Collected only at Yautepec, Morelos, by C. G. Pringle in 1901 (no. 8470, type) and October 3, 1902 (no. 11347), and by J. N. Rose, July 5, 1901 and in 1903 (no. 6576).

In foliage, flowers, and pods closely resembling *W. mexicana*.

ERYTHROXYLACEAE.

DESCRIPTIONS OF FOUR SPECIES OF ERYTHROXYLON.

Erythroxylon compactum Rose, sp. nov.

Shrubs 1.5 to 3 meters high, glabrous; branches short and often spurlike, usually elongating slowly from year to year, often covered with the imbricating bases of old stipules; old bark very dark, the young bark reddish brown rather thickly set with small lenticels; leaves 10 to 15 mm. long, obovate, retuse, somewhat cuneate at base; petioles 2 to 3 mm. long; stipules ovate, with scarious margins, persisting even after the leaves have fallen; flowers axillary, solitary but appearing as if clustered on account of the very short internodes; peduncles 1 to 2 mm. long; calyx teeth ovate; fruit 6 mm. long.

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[a] For a review of the species of Harpelyce see p. 42.

Collected by C. G. Pringle on rocky hills near Tehuacan, Puebla, August 3, 1897 (no. 6771).

It was distributed as a doubtful *E. brevipes* DC., a species of Porto Rico, from which it is certainly distinct.

Erythroxylon mexicanum H. B. K. Nov. Gen. & Sp. 5: 178. 1821.

I have not seen the type of *E. mexicanum*, which came from Chilpancingo, South Mexico, but among the several species which have recently been collected in Mexico my no. 1477 seems to answer the description best. My specimens are characterized by thickish leaves, finely reticulated above, and very short petioles hardly longer than the stipule. It comes from near sea level, having been collected at Acaponeta, Tepic, June 26, 1897.

Erythroxylon pallidum Rose, sp. nov.

Shrubs, glabrous; branches slender, dark brown; leaves oblong, 2 to 3 cm. long, 12 to 20 mm. broad, rounded or barely retuse at apex, rounded or slightly narrowed at base, pale on both sides; petioles 4 to 6 mm. long; stipules ovate, scarious on the margins; peduncles 2 or 3 mm. long; calyx lobes ovate, obtuse.

Collected by J. N. Rose on the hacienda of San Juan Capistrano, Zacatecas, August 18, 1897 (no. 2416, type) and August 22, 1897 (no. 2481).

Erythroxylon pringlei Rose, sp. nov.

Shrub, 3 meters or more high, glabrous; branches slender, dark, densely covered with small lenticels; leaves 1.5 to 3 cm. long, 10 to 17 mm. broad, obtuse or sometimes slightly retuse, cuneate at base; petioles 4 to 7 mm. long, terete; stipules ovate, acute; fruit axillary, solitary, on reflexed peduncles, oblong, 7 mm. long, red, slightly glaucous.

Collected by C. G. Pringle on mountains about Iguala, Guerrero, October 5, 1900 (no. 8406).

While probably near *E. mexicana* H. B. K., it appears to be specifically distinct.

MELIACEAE.

A NEW SPANISH CEDAR[a] FROM CENTRAL MEXICO.

Cedrela saxatilis Rose, sp. nov.

A small tree, 4 to 7 meters high, with slender trunk and smooth reddish bark; bark of the first-year branches brown, glabrous; bud scales hairy; leaves large, the upper ones with rachis 20 to 30 cm. long; leaflets 10 to 14, broadly lanceolate, 10 to 15 cm. long, 5 to 6 cm. broad at widest point, rounded at base, strongly acuminate, very slightly pubescent; inflorescence a large branching panicle, 30 cm. or more long, bearing many flowers; pedicels short and stiff about 1 mm. long, glabrous; calyx glabrous, its lobes short and obtuse; corolla 6 mm. long, densely appressed-pubescent without, glabrous or nearly so within, the lobes somewhat purplish, column about 2 mm. long, reddish, much longer than the ovary; stamens 5, the filaments slender, 2 mm. long; style 3 mm. long; stigma projecting from the mouth of the corolla; fruit 2 cm. long, 5-celled, filled with winged seeds.

Collected on the pedregal near Cuernavaca, Morelos, September 10, 1903, by J. N. Rose and Jos. H. Painter (no. 6950, type) and by C. G. Pringle (no. 11805).

The two collections here referred to came from the same tree. The tree was found growing among the volcanic rock along the trail which crosses the pedregal. Only one tree was seen during a whole day spent in this region, although others are doubtless to be found. It is a quite different species from my *C. occidentalis*, which grows in the low land along the west coast of Mexico.

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[a] For a revision of Cedrela see Contr. Nat. Herb. 5: 189–191. 1899.

POLYGALACEAE.

A NEW POLYGALA.

Polygala compacta Rose, sp. nov.

Shrubby at base, the stems numerous, erect or ascending, very slender, 10 to 12 cm. long, pubescent; leaves lanceolate to elliptical, obtuse, narrowed at base into a very slender petiole, puberulent, 1 to 2 cm. long; sepals lanceolate, acute, ciliate on the margin; wings broad; capsule puberulent, a little longer than broad, rounded at base, notched at apex; aril umbonate, the margin 3-lobed. Near but hardly identical with the *P. pubescens* of Chodat's Monograph, but in any case Chodat's name is to be rejected.

Collected by C. G. Pringle in Valley of Mexico, August 25, 1896 (no. 6425).

VITACEAE.

A NEW GRAPE FROM EASTERN MEXICO.

Vitis biformis Rose, sp. nov.

Tall vines; bark shredding, without distinct lenticels; young shoots and leaves densely covered with a brown tomentum hiding a short close pubescence; old leaves still pubescent above and with a more or less distinct cobwebby covering beneath, broadly ovate in outline, sometimes 3-lobed, shortly acuminate, with very small sharp teeth, and with a broad U-shaped sinus (rounded at its base); clusters rather small, 5 to 7 cm. long, but densely fruited; rachis pubescent; pedicels warty, stout; fruit blue-black, small, about 6 mm. in diameter.

Collected near Las Canoas by J. N. Rose, July 15, 1899 (no. 4882, type) and near the same locality by Dr. E. Palmer, 1902 (no. 232).

This species is near *V. berlandieri*, but the leaves are of duller color, the teeth smaller, etc.

TILIACEAE.

NOTES ON HELIOCARPUS, WITH NEW SPECIES.

In 1897 I published a synopsis of the species of Heliocarpus,[a] describing 5 species as new, restoring 6 old ones, and taking up the 3 recent ones of Dr. S. Watson. Dr. K. Schumann had previously studied the genus, reducing all the named species to *H. americanus*.

In 1898 Mr. E. G. Baker published a short but very important review[b] of my paper, accepting my expansion of the genus and differing from me only in a few details; he described two new varieties and reduced to varietal rank, under *H. popayanensis*, *H. trichopodus*, a species which I had doubtfully restored after a study of the description only.

As I have pointed out, the type of the genus is *H. americanus* L., which is figured in the Hortus Cliffortianus, a species which I was not able to make out after a study of a large suite of specimens. Mr. Baker finds a fragment of Clifford's plant in the herbarium of the British Museum, which he identifies as the same as *H. tomentosus*, our most common species. This conclusion is really surprising, for our very abundant Mexican material does not at all resemble Linnæus's figure. This difference is due, Mr. Baker thinks, to the fact that Clifford's plant was evidently young. While of course I am willing to accept Mr. Baker's conclusion, still I wish to keep in sight the possibility of *H. tomentosus* being a distinct species. It is possible that Houston's herbarium specimen (prepared probably in Mexico) may be different from the plant grown by Clifford even if the seed was sent by Houston. In fact, I have myself found *H. tomentosus* and *H. appendiculatus* growing side by side. Again, *H. americanus* is said to have come from Vera Cruz, while *H. tomentosus* probably does not grow at such low elevations. I have collected it myself at an altitude of 3,500 to 4,000 feet. In the light of Mr. Baker's review and my recent studies of the genus, I wish to make the following changes and additions to my paper:

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[a] Contr. Nat. Herb. 5: 125–129.

[b] Journ. Bot. 36: 130–132.

Heliocarpus americanus L. Sp. Pl. **1**: 448. 1753.

H. tomentosus Turcz. Bull. Soc. Nat. Mosc. **31**^{1}: 225. 1858.

Heliocarpus donnellsmithii Rose, Bot. Gaz. **31**: 110. *pl. 1.* 1901.

Mature leaves nearly orbicular, not lobed, rounded at base, shortly acuminate (tips mostly broken), glabrous and shining above, nearly glabrous beneath, palmately 3 to 5-veined from the base, somewhat glandular-toothed especially at base; inflorescence a large spreading panicle; sepals not appendaged; stipe slender, 5 mm. long; body of fruit oblong, 5 mm. long; the seeds somewhat hairy, becoming glabrate and rugose in age.

Collected by Capt. John Donnell Smith near Arenal, Department Alta Verapaz, Guatemala, altitude 967 meters, April, 1889 (no. 1722, type); and by Charles L. Smith at Coatzacoalcos, Isthmus of Tehuantepec, State of Vera Cruz, 1895 (no. 1002).

This species is very different from the numerous Mexican species but is near *H. americanus schumanni* Baker, from which it differs in its more glabrous leaves and in the absence of hairs both from the leaves and inflorescence.

Heliocarpus microcarpus Rose, sp. nov.

A small tree, 3 to 5 meters high; young branches densely stellate; leaves broadly ovate, 5 to 12 cm. long, 3 to 8 cm. broad, acuminate, cordate at base but with a rather shallow sinus, pubescent on both surfaces, the pubescence on under surface white and matted; inflorescence a very open panicle; flowers not seen; fruit sessile, orbicular or a little elongated, the body 3 mm. in diameter, fringed with a row of plumose hairs.

Collected by J. N. Rose and Walter Hough near Cuernavaca, May 27–30, 1899 (no. 4335), and at the same place by C. G. Pringle, November 23, 1902 (no. 8719, type).

Resembling *H. nelsoni* but with fruit smaller, without plumose hairs on the faces of the fruit, with much shallower sinuses at base of leaves, etc.

Here should probably be referred material collected at Cuernavaca and included in *H. nelsoni*.

Heliocarpus popayanensis purdiei Baker, Journ. Bot. **36**: 132. 1898.

This variety is based on Purdie's specimen in the Kew Herbarium collected near Velez, New Granada.

Heliocarpus popayanensis trichopodus (Turcz.) Baker, Journ. Bot. **36**: 132. 1898.

Heliocarpus trichopodus Turcz. Bull. Soc. Nat. Mosc. **31**[1]: 225. 1858.

Heliocarpus laevis Rose, sp. nov.

Small tree; old branches reddish, glabrous; young branches densely stellate; leaves lanceolate, mostly rounded at base, acuminate, thin, with scattered stellate hairs above, softly and densely stellate beneath, 3 or 5-nerved at base; inflorescence a small open panicle; sepals 4 or 5, each with a small appendage near the tip; fruit sessile, orbicular.

Collected by J. N. Rose west of Bolaños River near Bolaños, September 17, 1897 (no. 2860).

This species is near *H. polyandrus*, but with much smaller appendages to the sepals, leaves not cordate at base, and leaves not glabrate.

Heliocarpus polyandrus S. Wats. Proc. Am. Acad. **21**: 420. 1886.

This species has recently been collected in fruit from near the type locality by Mr. E. A. Goldman (no. 226). The fruit is orbicular and sessile and it therefore belongs to my second section and near *H. palmeri.*

Heliocarpus velutinus Rose sp. nov.

Undoubtedly a tree, but size not known, branches light brown, densely stellate-pubescent especially when young; leaves (only upper ones seen) nearly as broad as long, 13 cm. long on petioles 6 cm. long, above green and somewhat stellate, beneath very pale, densely and finely stellate-pubescent and reticulated, slightly 3-lobed, the lobes shortly acuminate; inflorescence a large terminal panicle; pedicels 2 to 4 mm. long; sepals minute, densely stellate-pubescent, 2½ mm. long, not appendaged at tip; petals and stamens not seen; fruit sessile, small, oblong, the body 5 mm. long by 2 mm. broad, stellate-pubescent on the faces, the margin of plumose hairs narrower than the breadth of carpel.

A very distinct species easily recognized by the white velvety under surface of the leaves and small oblong fruits. When keyed out in the synopsis above referred to it comes nearest *H. glanduliferus*, but is of course abundantly distinct from that species.

Collected by Mr. C. G. Pringle near Yautepec, Morelos, in 1902 (no. 8694).

TWO NEW BASSWOODS.

Mr. Hemsley in the Biologia Centrali-Americana credits two species of Tilia to Mexico, but unfortunately gives them both the same name, viz, *T. mexicana.* He seems to have seen no specimens of his second species, the *T. mexicana* Schlecht. Under his first species the "*T. mexicana* Benth," he records all the Kew material, which must embrace more than one form and a part of which doubtless belongs with the true *T. mexicana.* Below I present the description of the two new species:

Tilia occidentalis Rose, sp. nov.

Tree; bark on old branches dark brown and glabrous; young branches densely lanate; leaves broadly ovate to nearly orbicular, 10 cm. or less long, green and glabrous above, densely and rather coarsely tomentose beneath when young but becoming glabrate in age and then only slightly paler than the upper surface, the margin sharply toothed, strongly oblique at base or often slightly cordate, acute; the winged peduncle stalked at base, the wings unequal below, 8 to 12 cm. long; pedicels, calyx, and ovary densely pubescent.

Collected by C. G. Pringle in mountains about Patzcuaro, Michoacan, July 22, 1892 (no. 4126, type) and by E. W. Nelson at base of Mount Tancitaro, Michoacan, 1903 (no. 6874).

Perhaps nearest *T. mexicana*, but certainly with very different leaves.

Tilia houghi Rose, sp. nov.

A small tree, 8 to 10 meters high; young branches clothed with brown matted hairs; leaves nearly orbicular, 10 to 15 cm. long by 8 to 12 cm. broad, abruptly short-acuminate, somewhat oblique at base with a broad shallow or moderately deep sinus, very pale and densely stellate-pubescent beneath, dark green and glabrous above, the margin sharply serrate; the winged peduncle subsessile, very broad, obtuse, not reaching to the cyme; pedicels and buds densely stellate-pubescent, almost white.

Collected by J. N. Rose and Walter Hough in a mountain canyon above Cuernavaca, Morelos, May 27–30, 1899 (no. 4398).

Distinguished from *T. occidentalis* by its large broader leaves, which are much paler beneath and covered with a finer pubescence.

It gives me great pleasure to name this interesting tree for my companion in Mexican travels, Dr. Walter Hough of the U. S. National Museum.

MALVACEAE.

THREE NEW ABUTILONS.

Abutilon holwayi Rose, sp. nov.

Undoubtedly perennial and perhaps tall; branches slender with short spreading glandular hairs; leaves ovate, 8 to 10 cm. long, cordate at base (the sinus either closed or open), acuminate, crenate, the under surface with pale soft stellate pubescence, the upper surface stellate and with additional simple stiff hairs; petioles 2 to 6 cm. long; stipules small, linear, deciduous; inflorescence forming a leafy panicle; flowers axillary, on peduncles 2 to 3 cm. long; calyx 10 mm. high; sepals broadly ovate; petals yellow, perhaps not longer than the sepals, but open flower not seen; carpels 10 or more, long-acuminate, a little longer than the calyx lobes; cells 3-seeded.

Only known from about Oaxaca City.

Collected on Monte Alban by Charles L. Smith, October 4, 1894 (no. 636), and near Oaxaca City by E. W. D. Holway, November 10, 1903 (no. 5374, type).

Abutilon dentatum Rose, sp. nov.

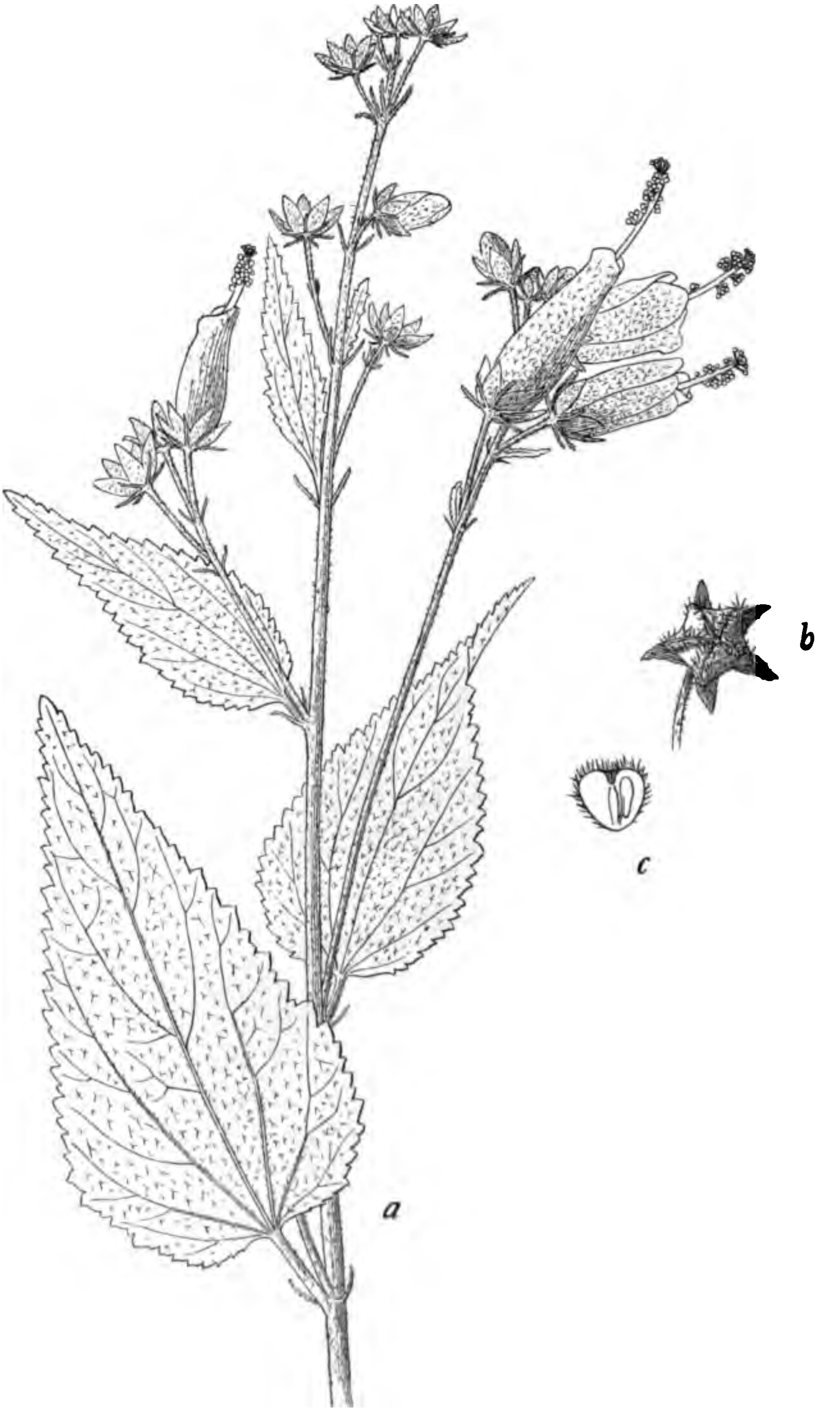
Apparently shrubby at base; branches densely stellate-pubescent with both coarse and very fine hairs; leaves broadly ovate, 7 to 10 cm. long, 4 to 6 cm. broad, strongly cordate at base, acuminate, coarsely toothed, densely stellate on both sides but the hairs finer and more matted beneath; flowers axillary; peduncles 1 to 4 cm. long, densely stellate, jointed near the apex; calyx lobes broadly ovate; carpels densely stellate, beaked.

Collected by C. G. Pringle, under dry cliffs, rocky hills near Chihuahua, October, 1885 (no. 306). This species was by Dr. Gray referred as a variety to *A. berlandieri*, but it surely must be distinct. Since Dr. Gray does not give a word of description his name is a *nomen nudum*. It is also so published by E. G. Baker in his revision. It differs from *A. berlandieri* in having the leaves more cordate at base, more acuminate, the teeth stronger and sharper, the sepals broader, etc.

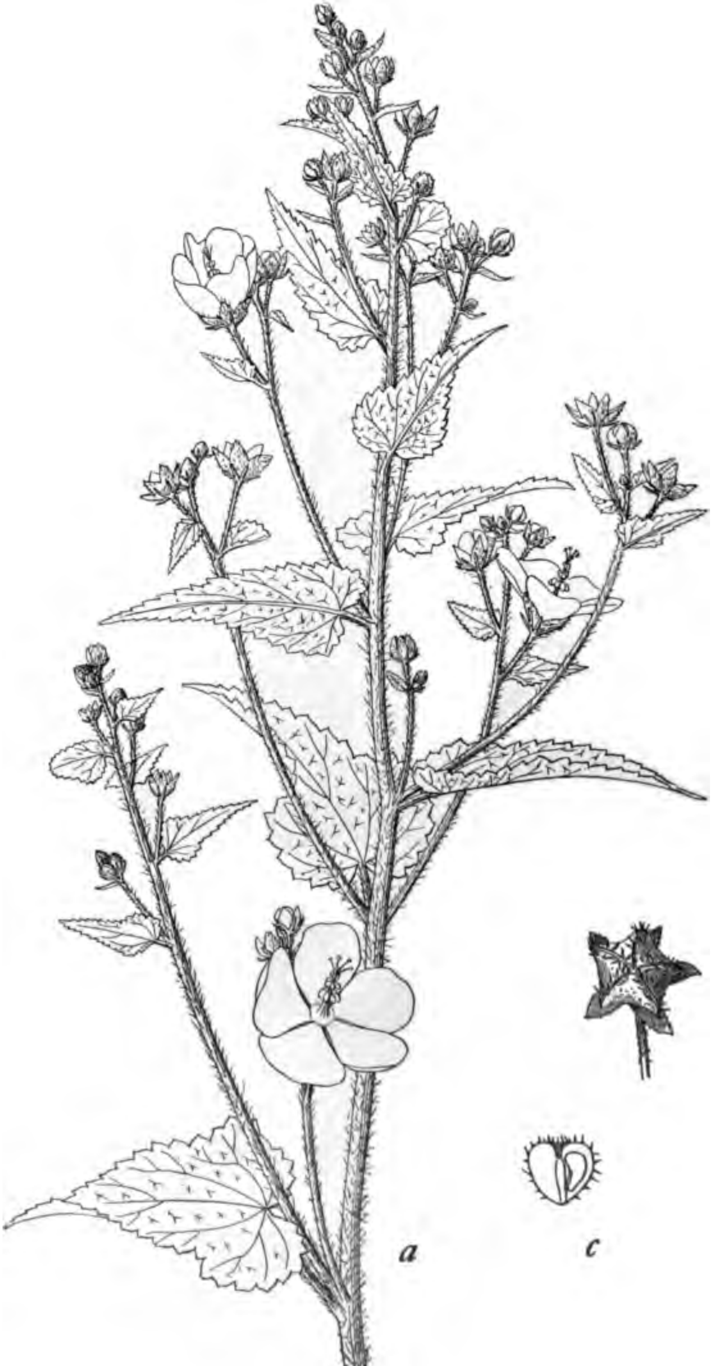
Abutilon simulans Rose, sp. nov.

Tall, often 2 to 3 meters high, much branched; branches purplish, bearing short stiff more or less glandular hairs; leaves broadly ovate, nearly orbicular, with a deep sinus at base and broad rounded over-lapping lobes, long-attenuate at tip, 15 to 18 cm. long, 5 to 10 cm. broad, the undersurface white with a very fine dense soft stellate pubescence, the upper surface green but much less stellate, the margin crenate; petioles much shorter than the blades; stipules caducous; flowers axillary; peduncles 3 to 4 cm. long, joined near the apex; calyx 8 to 10 mm. long, its lobes broadly ovate and overlapping at base, finely stellate and with a few long silky hairs; corolla 3 cm. broad, yellow; carpels with long slender beaks.

PLATE LXVII.



KOSTELETZKYA MALVAVISCANA ROSE.



KOSTELETZKYA VIOLACEA ROSE.

Resembling *A. hypoleucum*, but with very different pubescence on the stems, the leaves less tomentose beneath, not so rough above, more abruptly acuminate, the basal lobes more overlapping, the teeth and calyx lobes different, etc.

Specimens examined:

Jalisco: Near Magdalena, C. G. Pringle, October, 1893 (no. 4582); near Etzatlan, Rose and Painter, October 2, 1903 (no. 7510).

Morelos: Near Cuernavaca, C. G. Pringle, 1900 (no. 8427, type).

Oaxaca: Valley of Oaxaca, E. W. Nelson, September 28, 1894 (no. 1261); on Monte Alban, C. G. Pringle, September 5, 1894 (no. 5780).

TWO NEW KOSTELETZKYAS AND A NEW NAME.

Kosteletzkya malvaviscana Rose, sp. nov. PLATE LXVII.

Stem 120 to 180 cm. high; branches herbaceous, greenish, somewhat stellate-pubescent; leaves ovate, 7 to 12 cm. long, with a broad rounded or somewhat cordate base, acute or acuminate, stellate on both surfaces, somewhat irregularly crenate; petioles 2 to 5 cm. long; inflorescence a few-flowered axillary raceme on slender, sometimes elongated, peduncles; pedicels slender, 5 to 12 mm. long; involucre bracts 6 or 7, linear, about two-thirds the length of the calyx, 7 mm. long, parted to the middle, stellate-pubescent; lobes ovate, acute, 3-nerved; petals purplish or rose-colored, 2 cm. long, erect and Malvastrum-like; stamen tube elongated, much longer than the flowers; capsule depressed, 5-angled; cells 1-seeded as in genus; seed glabrous.

Collected by C. V. Hartman at Las Cuevas, Sonora, October 15, 1890, and distributed as *K. cordata* from which it must be very distinct.

EXPLANATION OF PLATE LXVII.—Fig. *a*, plant; *b*, fruit; *c*, section of immature fruit. Fig. *a*, natural size; *b* and *c*, twice natural size.

Kosteletzkya tampicensis (Moric.) Rose.

Hibiscus tampicensis Moric. Mem. Soc. Phys. Gen. **7**: 260. *pl. 14.* 1833.

This plant must be a Kosteletzkya rather than a Hibiscus, having the peculiar fruit of the former.

The species is based on Berlandier's no. 210, coming from near Tampico, Mexico.

Kosteletzkya violacea Rose, sp. nov. PLATE LXVIII.

Herbaceous, perhaps a meter high, more or less branched, densely pilose; leaves ovate to nearly orbicular, sometimes 3-lobed, finely stellate-pubescent on both sides and sometimes with large stellate or single hairs intermixed, serrate; flowers axillary and solitary; peduncles slender, 2 to 3 cm. long; bracts 6 to 8, linear, hardly half as long as the calyx; calyx deeply 5-parted; corolla spreading, pinkish or violet, 3 cm. broad; stamens united into a slender tube; anthers sessile, arranged in 3 rings; styles 5; capsule sharply 5-angled, finely stellate-pubescent, bristly on the angles.

Collected by C. G. Pringle at Jojutla, Morelos, June 13, 1901 (no. 9671) and 1902 (no. 8663, type).

EXPLANATION OF PLATE LXVIII.—Fig. *a*, plant; *b*, fruit; *c*, section of fruit. Fig. *a*, natural size; *b* and *c*, twice natural size.

TWO SPECIES OF ROBINSONELLA.

Robinsonella[a] **edentula** Smith & Rose, Bot. Gaz. **37**: 214. 1904.

Undoubtedly a shrub or small tree with branches and leaves, pedicels and buds, etc., stellate-pubescent; leaves nearly orbicular in outline, somewhat 3-lobed, the lobes acute, obtuse or even rounded, entire or with faint indications of teeth, slightly pubescent above, softly stellate pubescent beneath, 6 to 10 cm. long, with a deep rather narrow sinus; flowers very abundant in axillary panicles; peduncles slender, pilose as well as stellate, 8 to 16 mm. long, jointed near the apex; corolla violet,

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[a] For the establishment of this genus and the description of the other species see Garden and Forest **10**: 245. 1897.

2 cm. broad; staminal tube very short; carpels 7 mm. long, obtuse with thin reticulated walls.

Collected by H. von Turckheim at Coban, Department of Alto Verapaz, Guatemala, altitude 1,300 meters, November, 1902 (J. D. Smith's no. 8382).

Nearest *R. divergens*, but with less densely stellate branches, leaves with entire margins, shorter staminal tube, less densely pubescent ovaries, much smaller carpels, and pilose pedicels.

Robinsonella pilosa Rose, sp. nov.

Differs from the above in having the base of the blades not lobed, the older leaves glabrate, the pedicels more pilose, and the buds very densely pilose.

Collected by Gustavo Neiderlein in the Comayagua between the villages of Flores and Comayagua, Honduras, February 22, 1898.

BOMBACEAE.

TWO NEW SPECIES OF CEIBA AND A NEW NAME.

Ceiba pallida Rose, sp. nov.

A large tree; young branches either glabrous and glaucous or more or less densely pubescent; leaves long-petioled; leaflets 5 to 7, oblanceolate, cuneate into a short petiolule, long-acuminate, slightly pubescent (hairs simple) on both sides, very pale beneath, sharply and closely serrate, the teeth usually spreading; flowers very large; calyx large and broad, 2 to 2.5 cm. long, nearly as broad at mouth, the lobes apparently deciduous giving a somewhat 5-lobed calyx tube, glabrous and glaucous without, densely reddish-pubescent within; petals 12 to 14 cm. long, 2 cm. broad, densely covered without with long brownish silky hairs; stamen tube 2 mm. long, densely brownish-lanate; free part of filaments alternating with small brownish scales, 7 to 8 cm. long, glabrous, much shorter than the petals; style glabrous.

Collected by J. N. Rose and Walter Hough near Cuernavaca, May 27 to 30, 1899 (no. 4337, type) and by C. G. Pringle from the same tree, May 31, 1899 (no. 8212). With these I have tentatively placed Rose and Hough's plant (no. 4564) from Tomellin Canyon, Oaxaca, although it is without flowers or fruit. This species is nearest the Yucatan plant *C. aesculifolia*, but with different serrations to the leaves, etc. It differs from the northern species *C. tomentosa* and *C. acuminata* in the simple hairs of its pubescence.

Ceiba parvifolia Rose, sp. nov.

A tree 6 meters high with a broad spreading top; old branches reddish and smooth; young branches somewhat reddish-pubescent; leaflets 5, small, 3 to 5 cm. long, obovate, narrowly cuneate at base into a slender petiole, rounded at apex except for an abrupt apiculation, more or less stellate on both sides but soon becoming glabrate, slightly paler beneath.

Collected by the writer on the dry hills near the little town of Matamoras, Puebla, June 26, 1899 (no. 4701). Unfortunately no flowers were obtained, but a photograph was taken which shows well the habit.

Perhaps with this species is to be associated my no. 4670 from Tomellin Canyon. The leaflets, however, are more pubescent and only a little or not at all apiculate. Palmer's no. 603 from Acapulco is also somewhat similar, but the leaflets are glabrous. Rose and Painter's no. 6564 from Yautepec probably belongs here, but the leaflets are perfectly glabrous.

Ceiba acuminata (S. Wats.) Rose.

Eriodendron acuminata S. Wats. Proc. Am. Acad. **21**: 418. 1886.

Type locality, "Hacienda San Miquel," Chihuahua; collected by Dr. E. Palmer.

This species is only known from the type collection and has never been collected in flower. It must be near *C. tomentosa* and with the material in hand it is difficult to separate them. The flowers may show some good specific differences.

STERCULIACEAE.

TWO NEW SPECIES OF AYENIA.

Ayenia nelsoni Rose, sp. nov.

Shrub 60 to 90 cm. high; branches densely hirsute; leaves lanceolate, 7 to 10 cm. long, densely soft stellate tomentose beneath, the pubescence not quite so soft or dense above; flowers "dark maroon red;" peduncles numerous in the leaf axils; buds acuminate; sepals 3 to 4 mm. long, lanceolate, acuminate; blade of petal small, 1 to 2 mm. long, deeply notched at base, the lobes obtuse; ovary densely lanate; style as long as ovary; stipe wanting.

Collected by E. W. Nelson on roadside between San Ricardo and Ocozantla, Chiapas, August 18, 1895 (no. 2982).

Resembling *A. berlandieri*, but with smaller flowers, more pubescent leaves, shorter stipes to the fruit, etc.

Ayenia compacta Rose, sp. nov.

A low compact shrub, 10 cm. or less high, much branched at base; young branches clothed with a short crisped pubescence; leaves small, 1 cm. long, ovate, serrate, covered on both sides with small stellate hairs; peduncles solitary, axillary, naked, pubescent, 3 to 4 mm. long; fruit 4 mm. high, slightly pubescent and covered with short brown papillæ; stipe very distinct, 2 mm. long.

Collected, by Dr. E. Palmer near Santa Rosalia, Lower California, March 15, 1890 (no. 268) and distributed as *A. microphylla*. It differs, however, from the last named species in the texture of the leaves, in the fruit, etc.

A NEW MELOCHIA.

Melochia arida Rose, sp. nov.

Shrub 30 to 60 cm. high; leaves ovate, obtuse, thickish, strongly nerved beneath, deeply furrowed above, 2 to 4 cm. long, short-petioled, densely stellate; flowers very fragrant, purplish, medium size; fruit oblong, 5-winged, nearly truncate at base, abruptly acuminate. Type collected by J. N. Rose in yards in the town of Guaymas, June 5, 1897 (no. 1205); also from the same station by Dr. E. Palmer.

It was referred to *M. tomentosa* by Dr. Watson.

This species differs from Dr. Watson's *M. speciosa* from the same region in several striking respects including size of flowers and leaf and fruit characters.

THEACEAE.

THE MEXICAN SPECIES OF TAONABO.[a]

I have followed the treatment as given by Ign. v. Szyszylowicz in Engler and Prantl's Pflanzenfamilien in taking up the older name Taonabo for the somewhat more familiar one of Ternstroemia.

Mr. Hemsley recognizes but 5 species of Ternstroemia from Mexico and Central America, all of which until recently have been wanting in the National Herbarium. Our recent large consignments of Mexican plants have not only supplied some of these species, but have added

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[a] **Taonabo** Aubl. Pl. Gui. **1**: 569. *pls. 227, 228.* 1775.

Ternstroemia Mutis; L. f. Syst. Veg. Suppl. 39. 1781.

Type species of Ternstroemia *T. meridionalis* Mutis; Taonabo based on two species *T. dentata* and *T. punctata.*

Collected by E. W. Nelson on mountain ridges on west side of valley of Cuicatlan, Oaxaca, altitude 2,250 meters, November 10, 1894 (no. 1902).

Taonabo sylvatica (Cham. & Schlecht.) Syzsz. in Engl. & Prantl Nat. Pflanzen fam. **3**^{6}: 189. 1893. FIGURE 14.

Ternstroemia sylvatica Cham. & Schlecht. **5**: 220. 1830.

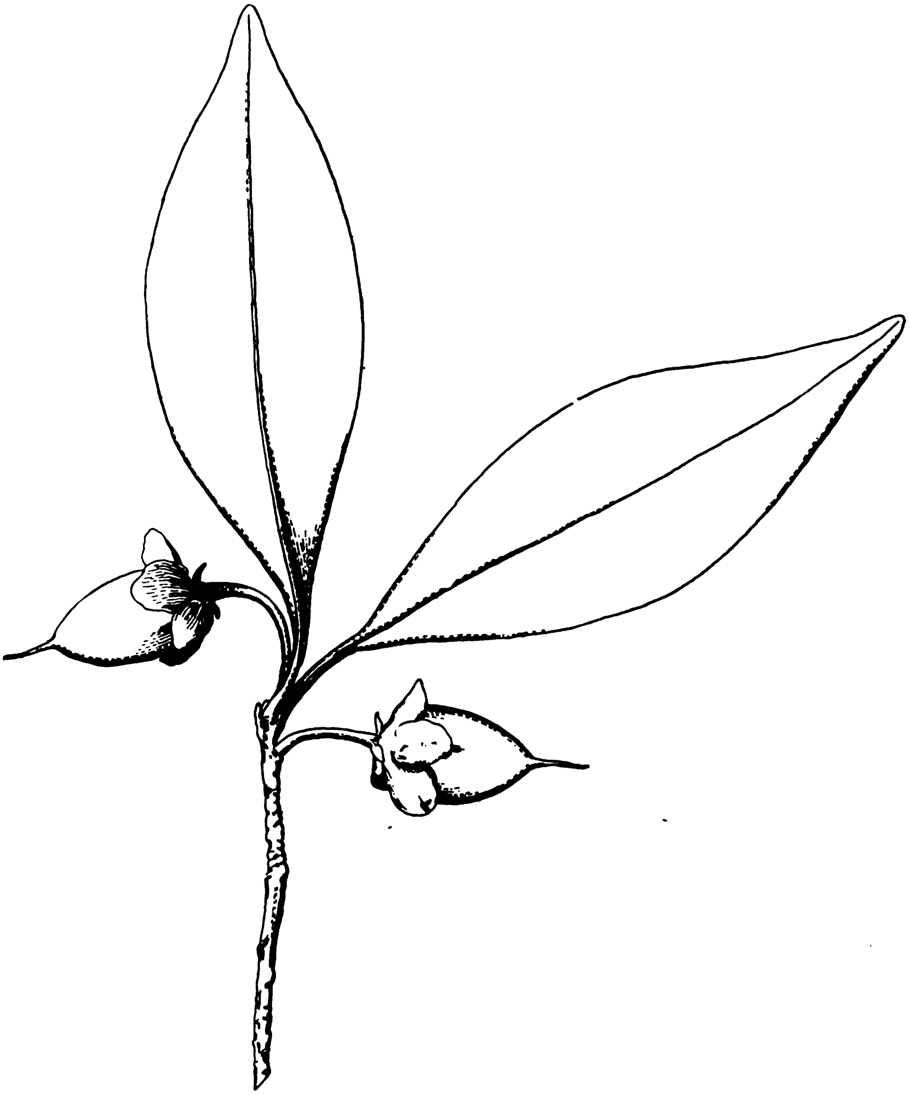

FIG. 14.—*Taonabo sylvatica.*

The type was based on specimens from two localities: one from "inter Jalapan et San Andres" the other from "prope San Miquel del Soldado."

Collected by Schiede and Deppe. From the latter place Mr. Pringle collected his no. 8169.

Taonabo tepezapote (Cham. & Schlecht.) Syzsz. in Engl. & Prantl, l. c.

Ternstroemia tepezapote Cham. & Schlecht. Linnaea **6**: 420. 1831.

Type locality "Tecoluto" or perhaps it is Tecolutla on the coast of Vera Cruz.

Collected by E. W. Nelson on mountain ridges on west side of valley of Cuicatlan, Oaxaca, altitude 2,250 meters, November 10, 1894 (no. 1902).

Taonabo sylvatica (Cham. & Schlecht.) Syzsz. in Engl. & Prantl Nat. Pflanzen fam. 3^6: 189. 1893. FIGURE 14.

Ternstroemia sylvatica Cham. & Schlecht. **5**: 220. 1830.

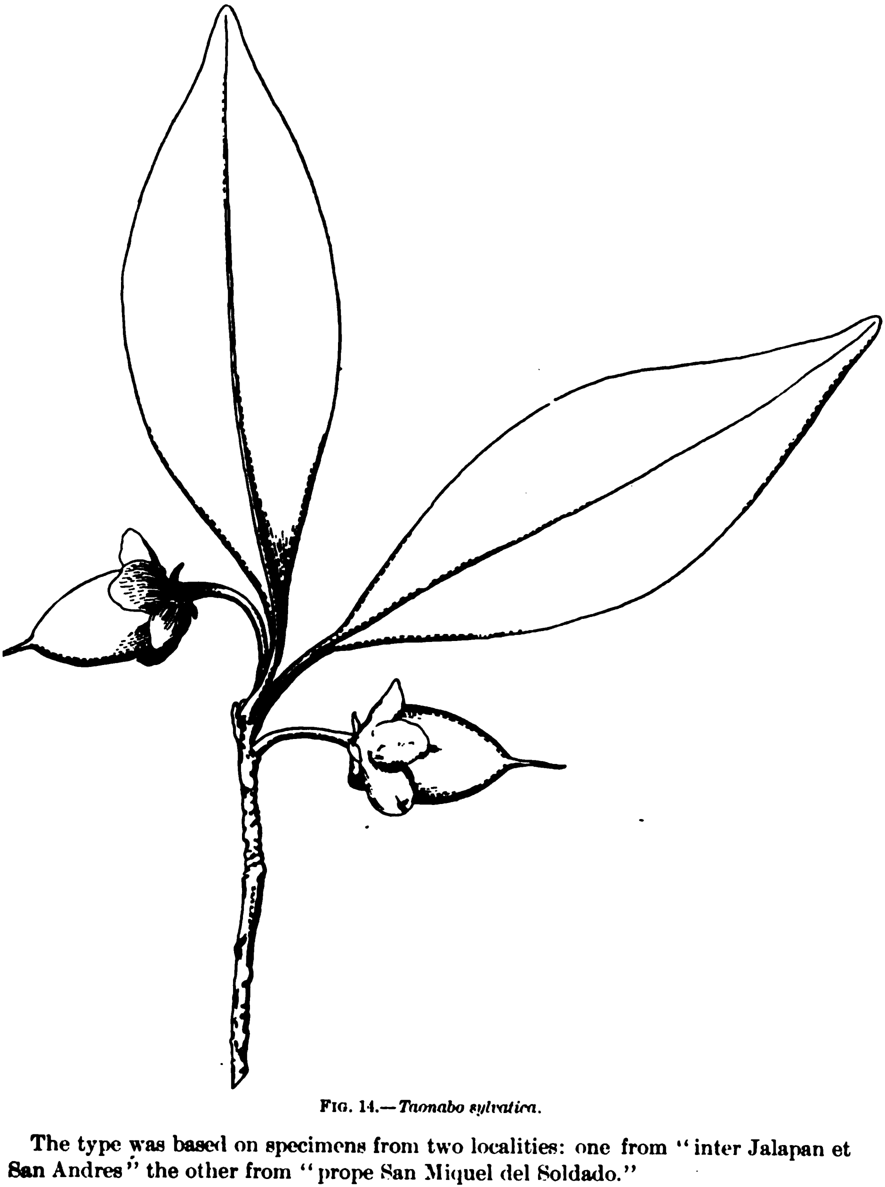

FIG. 14.—*Taonabo sylvatica*.

The type was based on specimens from two localities: one from "inter Jalapan et San Andres" the other from "prope San Miquel del Soldado."

Collected by Schiede and Deppe. From the latter place Mr. Pringle collected his no. 8169.

Taonabo tepezapote (Cham. & Schlecht.) Syzsz. in Engl. & Prantl, l. c.

Ternstroemia tepezapote Cham. & Schlecht. Linnaea **6**: 420. 1831.

Type locality "Tecoluto" or perhaps it is Tecolutla on the coast of Vera Cruz.

BEGONIACEAE.

A PECULIAR BEGONIA FROM SOUTHERN MEXICO.

Begonia unifolia Rose, Rep. Mo. Bot. Gard. **15**: 80. 1904.

PLATE LXX and FIGURE 15.

Tuberous-rooted; leaf single, lying close upon the ground, sessile, nearly orbicular, 10 to 30 cm. broad, with mostly 10 to 12 radiate once or twice forked principal veins, deeply cordate with overlapping lobes, deltoidly dentate with unequal teeth and frequently shallowly and broadly crenate, like the scape loosely white-villous with soft collapsible hairs that are mostly confined to the veins beneath but are scattered over the upper surface, and turn brown in drying; scape 40 to 60 cm. high, emerging through the base of the sinus, usually solitary, at first simple and staminate, later with one or more pistillate branches above the middle which are subtended by suborbicular, deeply dentate often cuneate bracts sometimes 4 to 6 cm. in diameter; bractlets small, persistent, deeply cleft and lacerate; flowers nearly white, glabrous, few at the end of the scape and its branch or branches, on slender glabrous or somewhat villous pedicels of about their own length; staminate flowers about 25 mm. in diameter with 2 suborbicular often fimbriate sepals and 2 elliptical or spatulate narrower petals; stamens many, crowded, with globose-cuneate small anthers much shorter than the distinct filaments; pistillate flowers longer-stalked, with 5 caducous rather narrow perianth segments scarcely half as long as those of the staminate flowers; fruit 10 to 25 mm. long, 3-celled, with 3 wings, of which one is much broader than the others, truncate above, cuneate or on the shorter capsules rounded at base; *placentae* 2-cleft, bearing seeds on both surfaces; styles 3, short, forked, with continuous loosely spiral papillate stigmas.

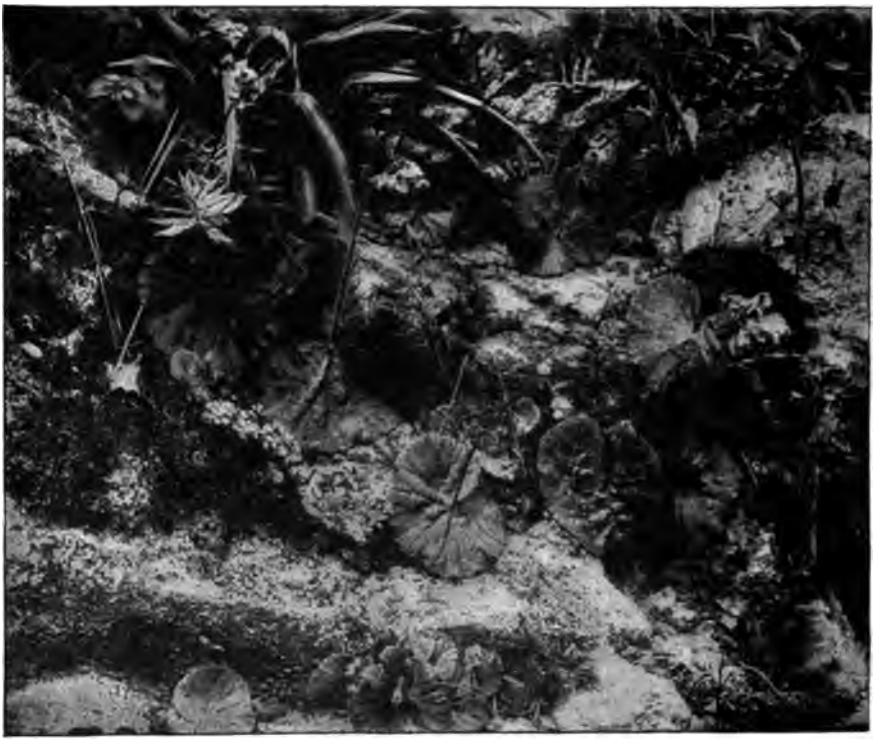

FIG. 15.—*Begonia unifolia* and its surroundings.

Collected by C. G. Pringle on banks of disintegrating limestone near Jojutla, Morelos, August 30, 1902 (no. 8690, type) also near Iguala, Guerrero, October 3, 1900 (no. 9225), also at Iguala by Dr. Wm. Trelease, August 8, 1903.

The following paragraph taken from the Report of Missouri Botanical Garden is published with the permission of the Director, Dr. William Trelease, who has also consented to the use of the two plates which illustrated his article.

While making observations on an undescribed Agave which grows on the vertical cliffs of a deep marble canyon a few miles above Iguala in the State of Guerrero, last summer, my attention was attracted by an abundant Begonia which grew in similar situations and differed from all of the other species of this genus that I had seen in possessing only a single radical leaf, through the sinus of which a few-flowered scape arose,—naked except for a rather small leaf-like bract subtending its single branch, and much smaller bracts in the inflorescence proper. Though my time was largely occupied with the Agave for which I had visited the canyon, herbarium and living specimens and photographs of the Begonia were secured, and a subsequent study of this material showed that the species belongs to the Section Huszia of modern writers, which Klotzsch regarded as a genus separable from Begonia, its only close ally being *B. monophylla* Pavon in DC. Prod. **15**^{1}: 284. The latter, so far as I can learn, is known only from the type sheet in the Boissier herbarium, the label of which attributes it to New Spain. This group, Huszia, is that of the so-called tuberous begonias, some of which are now popular in cultivation,—nearly all of them coming from the Bolivian or Peruvian Andes. *B. monophylla* is said to produce a tuber 9 lines thick and to have a single petioled 12 to 15-nerved very shortly pilose leaf which is cordate or sometimes peltate, and rather large flowers.

On showing my material to Dr. J. N. Rose, whom I met in the City of Mexico, I learned that apparently the same species had been earlier collected by C. G. Pringle, and distributed in his set of 1902 under the manuscript name *B. unifolia* Rose: a fact verified at my return to St. Louis—the distributing number being 8690.

Aside from its northern distribution for a species of the Section Huszia, the rather uncertain source of its closest relative, *B. monophylla*, and the single leaf which, like the latter, it produces, *B. unifolia* is of interest in that its single large leaf is closely applied to the rock or talus in the crevices of which it is rooted, so that its subterranean parts are thus given the same kind of protection afforded by the similarly appressed basal leaves of the stag-horn ferns, Platycerium.

EXPLANATION OF PLATE LXX.—Fig. *a*, plant; *b*, male flower; *c*, stamens; *d*, female flower; *e*, capsule; *f*, cross section of capsule. Fig. *a*, scale $\frac{3}{10}$; *b*, *c*, and *f*, scale $\frac{4}{1}$; *c*, and *c*, scale 3.

MELASTOMATACEAE.

RESTORATION OF SCHIZOCENTRON.[a]

In studying several years ago the original description of *Heeria elegans*, the type species of the genus Heeria of Schlechtendal, I was astonished at the differences between it and all the other species included in the genus by M. Cogniaux. But as no material of this species was at hand, the study was laid aside for the time being. In the summer of 1899, however, I visited Jalapa, Mexico, in the hope of obtaining *H. elegans*, and was successful in collecting both herbarium specimens and seeds. The differences suggested by the description were more than borne out by the living plant. It is characterized by its creeping vine-like habit, its ovate leaves 3-nerved from the base, its large solitary terminal long-peduncled purple flowers, and its persistent calyx lobes. In all these respects it differs from the other species referred to Heeria, which should therefore now be restored to

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[a] **Schizocentron** Meissn. Gen. Comm. 355. 1843.

Heeria Schlechtendal, Linnaea **13**: 432. 1839, not Meissn. 1837.

Type species *S. elegans* Meissn. l. c.

Heterocentron, while the Heeria of Schlechtendal itself, being a homonym, must give place to Schizocentron.

Schizocentron elegans (Schlecht.) Meissn. l. c.

Heeria elegans Schlecht. Linnæa **13**: 432. 1839.

Rhexia elegans Schlecht. l. c.

A low creeping vine-like plant forming a dense carpet and rooting at the joints; branches terete or nearly so, reddish, somewhat appressed-pubescent; leaves ovate, distinctly petioled, obtuse, 5 to 10 mm. long, dark green above, slightly pubescent; flowers solitary and terminal on slender peduncles 1.5 to 2 cm. long; calyx tube about 6 mm. long covered with glandular bristles, the bases (in age) forming enlarged closely set tubercles; sepals ovate, 4 mm. long, ciliate; corolla a deep purple, 2 to 2.5 cm. broad, spreading; 4 anthers sessile, erect, yellowish, 4 reflexed and larger, the cells and stalks purplish but the appendage yellowish; ovary crowned by a prominent lacerate border.

Type locality; "pr. Jalapa" & "pr. Chiconquiaco." Only known from the region about Jalapa, Mexico.

Specimens examined:

Vera Cruz: in garden at Jalapa, August 13, 1901, J. N. Rose (no. 6081).

This is a very dainty plant and well worthy of ornamental cultivation. It is now grown in some of the Mexican gardens, but I have no knowledge of its being planted elsewhere. I have been told that seed was frequently sent to Germany and possibly it has gotten into trade under a different name. Plants are now growing in one of the greenhouses of the Department of Agriculture, where it flowered in 1904.

A SYNOPSIS OF THE SPECIES OF HETEROCENTRON.[a]

Out of deference to Professor Cogniaux I have very long delayed restoring the Heterocentron of Hooker and Arnott to generic rank, but I have no doubt that if he had the material now in the National Herbarium he would not hesitate to make the change himself. Into it go all the species of Heeria except *H. elegans*, all of which have heretofore been described under that genus except the new one here proposed. I have also restored *H. mexicanum*, the type of the genus, which comes from western Mexico but which for a long time has been resting under the name of *Heeria subtriplinervia*, a very different species from eastern Mexico. *H. undulatum* has also been little understood. It seems close to *H. mexicanum*, but I am inclined to admit the species until the types can be more carefully looked into.

I have not found the characters of the crown used by Triana and Cogniaux to be very constant as flowers from the same branch will have the crown setose or naked. The following key, while it may require correction and additions, serve to distinguish the species in the National Herbarium.

KEY TO THE SPECIES OF HETEROCENTRON.

- Pedicels glabrous .... 1. ***H. subtriplinervium.***
- Pedicels pubescent.
  - Calyx tube not glandular.
    - Calyx lobes ciliate on the margins .... 2. ***H. macrostachyum.***
    - Calyx lobes not ciliate on the margins.
      - Leaves deep green, narrow (1 to 3 cm. broad) .... 3. ***H. roseum.***
      - Leaves pale green, broad (2.5 to 3 cm. broad) .... 4. ***H. occidentale.***
  - Calyx tube glandular.
    - Calyx lobes ciliate on margin .... 5. ***H. undulatum.***
6. ***H. mexicanum.***
    - Calyx lobes not ciliate on the margins .... 7. ***H. axillare.***

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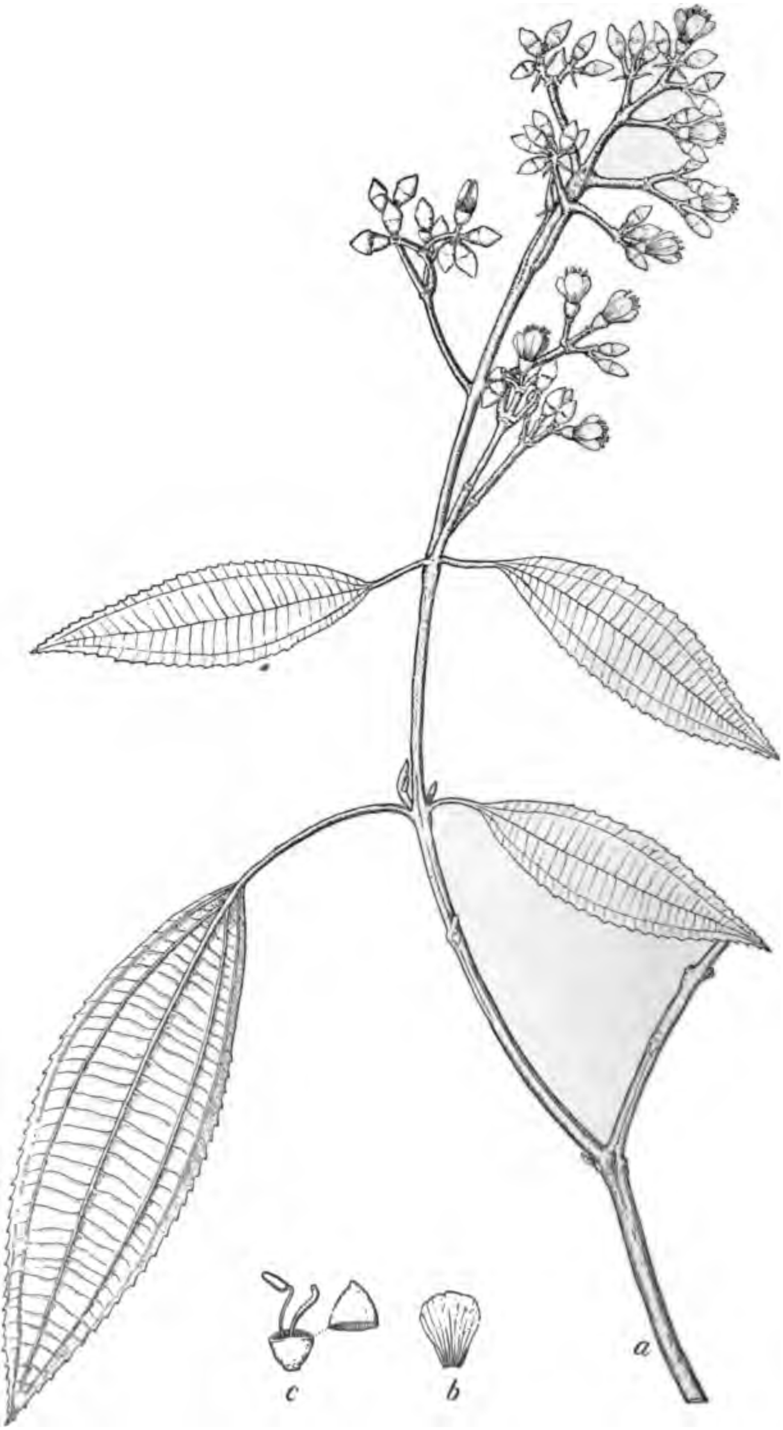
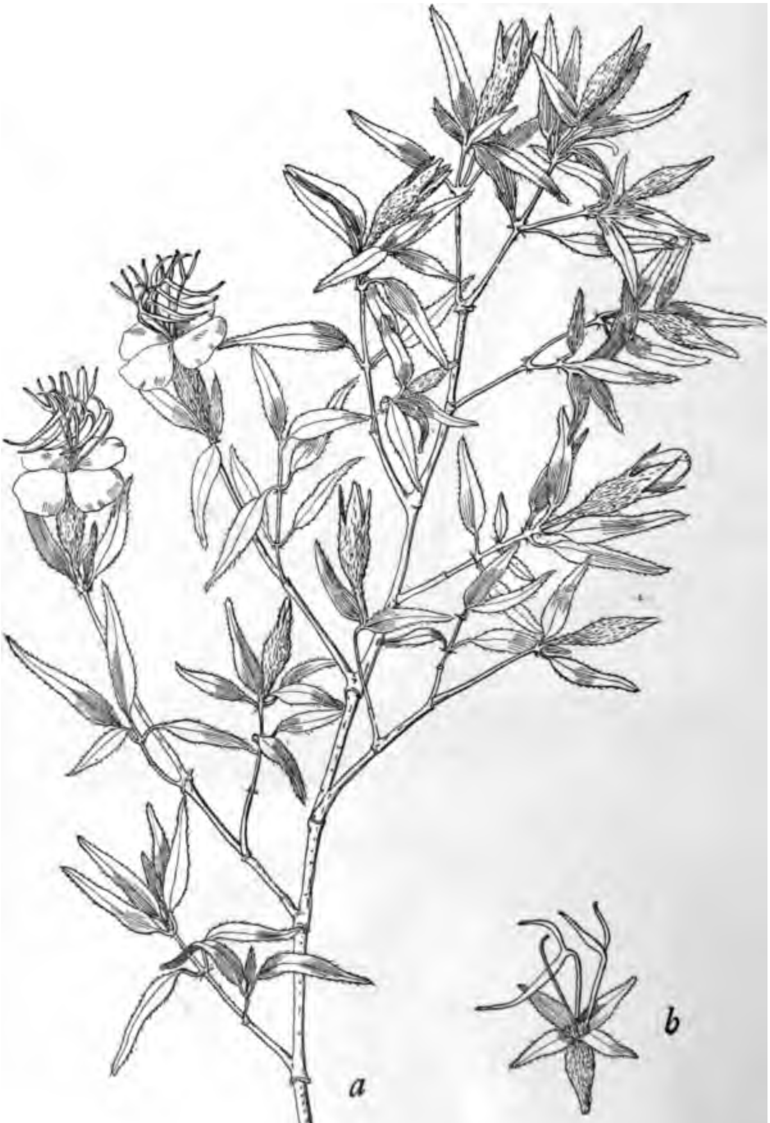
[a] HETEROCENTRON Hook. & Arn. Bot. Beech. 290. 1840.

Type species *H. mexicanum* Hook. & Arn. l. c.



CONOSTEGIA MINUTIFLORA ROSE.



MONOCHAETUM PRINGLEI ROSE.

Heterocentron occidentale Rose, sp. nov.

A shrub 180 to 200 cm. high; branches 4-angled, the younger ones reddish and densely appressed-pubescent; leaves lanceolate, 6 to 8 cm. long, 2.5 to 3 cm. broad, obtuse, cuneate, often oblique at base, tapering into a distinct petiole, very pale and densely appressed-pubescent on both sides, with 4 or 5 pairs of lateral veins; inflorescence a few-flowered cyme; calyx tube about 6 mm. high, covered with short broad almost triangular hairs, in age almost tubercled; calyx lobes acuminate, glabrous; stamens as of the genus; ovary (in specimens examined) not setose.

Collected by J. N. Rose in the foothills of the Sierra Madre between Pedro Paulo and San Blascito, Tepic, August 4, 1897 (no. 1980).

NEW SPECIES OF TWO GENERA.

Conostegia minutiflora Rose, sp. nov. PLATE LXXI.

A small shrub, 90 to 240 cm. high with the young branches densely stellate; leaves lanceolate, narrowed at base, acuminate, 5-nerved, 7 to 12 cm. long, in age glabrous above, densely white tomentose beneath; petiole 10 to 35 mm. long; inflorescence a terminal panicle; flowers sessile or nearly so; buds small, 4 mm. long, acute, densely stellate for the lower half, the circumscissile cap glabrous or nearly so; petals pink, [illegible] mm. long; style 3 mm. long.

Collected by E. W. Nelson about Plunia, Oaxaca, altitude 900 to 1,040 meters, March 17, 1895 (no. 2493a).

This species is perhaps nearest *C. lanceolata*, but has different pubescence, smaller flowers, etc.

EXPLANATION OF PLATE LXXI.—Fig. *a*, plant; *b*, petal; *c*, calyx, stamen and ovary. Fig. *a*, natural size; *b* and *c*, enlarged.

Monochaetum pringlei Rose, sp. nov. PLATE LXXII.

A shrub; branches glabrous somewhat setose at the nodes; leaves narrowly lanceolate, 2 to 4 cm. long, 3 to 6 mm. broad, cuneate at base, acute, glabrous above, with a few scattered hairs beneath, a little ciliate on the margin, entire, 3-nerved; petioles reddish, 2 to 4 mm. long; flowers solitary, terminal; peduncle 6 to 8 mm. long, with scattered appressed hairs; calyx-tube urn-shaped, 6 to 8 mm. long, with scattered appressed (some glandular) hairs; lobes 2 mm. long, obtuse, ciliate, reddish; petals purplish.

Collected by C. G. Pringle near Cuernavaca, Morelos, altitude 1,950 meters, November 1, 1896 (nos. 6976, 7352); Sierra de Tepoxtlan, 1890 (no. 8359, type), and 1902 (no. 9785).

This species differs from all the other Mexican species in having glabrous stems.

EXPLANATION OF PLATE LXXII.—Fig. *a*, plant; *b*, flower. Figs. *a* and *b*, natural size.

ONAGRACEAE.

INTRODUCTORY NOTE.

Sometime before Professor Léveillé's monograph of Oenothera began to appear I took up the study of our Mexican species of that genus with the hope of preparing a usable key. I was greatly disappointed to find that our herbarium material was very scanty and that a considerable number of the species are only known by the original collection from which they were described. Though I have prepared a tentative treatment of this group there are various species whose status is still uncertain, and as there seems to be no pressing need for a revision I shall withhold most of my manuscript until much more material has been studied.

Mr. Hemsley enumerates in the Biologia 25 species from Mexico, while the number of species known today is about 40. Mr. Hemsley's treatment was the old one, in which Oenothera was considered a polymorphic genus. The Mexican species have never been considered in the light of recent classification and for this reason the review was undertaken with considerable interest and I trust without prejudice. My judgment is that there are 8 genera in Mexico, although some may prefer to call them only sections. Professor Léveillé does not believe in breaking up Oenothera, but since he has so wholly disregarded its natural groups his conclusions as to the generic limitations will have little weight.

NEW HARTMANNIAS.

Hartmannia berlandieri (Spach) Rose.

Oenothera berlandieri Walp. Rep. **2**: 85. 1843.

Xylopleurum berlandieri Spach in Nouv. Ann. Mus. Par. **4**: 370. 1835.

The *Xylopleurum berlandieri* of Spach seems not to have been reported since that author's time. There are, however, in the National Herbarium a number of sheets which have heretofore passed as *Oenothera* or *Hartmannia tetraptera* but which answer better to this species. As I have not yet seen Berlandier's plant there is of course still some doubt whether my specimens are identical, but there is little question that Spach's name deserves recognition under Hartmannia.

Hartmannia cuprea (Schlecht.) Rose.

Oenothera cuprea Schlecht. Linnaea **12**: 269. 1838.

I have collected near the type locality of *Oenothera cuprea* Schlecht. a Hartmannia which I have referred here for want of a better place. My specimen (no. 5672) was growing as a weed in cultivated ground, which may account for its large size. Mr. Seaton's plant (no. 212), also from Mount Orizaba (alt. 3,450 meters), is more typical.

I have also referred here two specimens collected by the writer from the high mountains of Central Mexico, no. 5611 from Sierra de Pachuca, Hidalgo, July, 1901, and no. 5713 from Flor Maria, State of Mexico, July, 1901.

Type locality: "In prato elatiore montis Orizaba."

Hartmannia dissecta (Gray) Rose.

Oenothera dissecta Gray, in S. Wats. Proc. Am. Acad. **17**: 357. 1882.

Megapterium dissectum Small, Bull. Torr. Bot. Club **23**: 184. 1896.

Oenothera dissecta has clearly the fruit of a Hartmannia rather than a Megapterium, and I therefore have no hesitancy in transferring it to the former genus.

We have the following material in the National Herbarium:

San Luis Potosi: Near San Luis Potosi, Parry and Palmer, 1878 (no. 249); J. Barreta, no date.

Durango: Near Durango City, Dr. E. Palmer, 1896 (no. 966).

Type locality: "In sandy localities near San Luis Potosi."

Hartmannia havardii (S. Wats.) Rose.

Oenothera havardii S. Wats. Proc. Am. Acad. **20**: 366. 1885.

Doctor Small has recently referred this species, with *Oenothera dissecta* A. Gray, to *Megapterium dissectum*. The two species while similar in habit and foliage are evidently distinct. The former is distinguished especially by its very short style branches and its cohering calyx tips.

Type locality: "On prairies near Morfa, western Texas." Collected by V. Havard.

Hartmannia latiflora (Ser.) Rose.

Oenothera latiflora Ser. in DC. Prod. **3**: 50. 1828.

Seringe's *Oenothera latiflora* was based upon Mocino and Sessé's drawing (DC. tracing no. 376). He questions whether this species should not be referred to *tetraptera*. A comparison of the published illustrations of the two indicates a difference in pubescence, foliage, etc., and I am inclined to keep them distinct.

Specimens collected by the writer on Sierra de Pachuca, Hidalgo (no. 5638) seem to answer *H. latiflora* fairly well.

Type locality: "In Mexico."

Hartmannia montana Rose, sp. nov.

Stems branching, the branches 30 to 40 cm. long, pubescent; leaves oblong, 6 to 10 cm. long, slightly pubescent, entire or nearly so, acute, shortly petioled; calyx tube pilose, 1 cm. or less long; petals drying purplish; fruiting peduncle 2 to 4 cm. long; capsule 1.5 cm. long, broad at apex.

Collected at Cima station, State of Mexico, on the railroad between City of Mexico and Cuernavaca, by J. N. Rose and Jos. H. Painter, September 19, 1903 (no. 7170).

Hartmannia palmeri Rose, sp. nov.

Acaulescent or with very short stems, glabrous throughout, with the habit and foliage of *H. dissecta* and *H. havardi;* calyx tube very slender, 5 cm. long, twice longer than the calyx segments; calyx buds long-acuminate; tips of segments free in bud; style branches short; expanded corolla 6 cm. broad, purplish in dried specimens; ovary as well as calyx glabrous.

A very showy and beautiful plant.

Collected by Dr. E. Palmer near City of Durango, 1896 (no. 45).

Hartmannia reverchoni Rose, sp. nov.

A low diffuse perennial, its branches slender and wiry, slightly pubescent; leaves all linear, laciniately lobed or toothed, slightly pubescent or early glabrate, 2 to 4 cm. long; flowers axillary, sessile; sepals 10 to 12 mm. long; petals 12 to 15 mm. long, pale pink; capsule including the very stout woody base 15 mm. long; seed glabrous.

Collected by J. Reverchon along the railroad east of Laporte, Tex., June 16, 1903 (no. 3554).

NEW NAMES IN LAVAUXIA.

Lavauxia tubifera (Ser.) Rose.

Oenothera tubifera Ser. in DC. Prod. **3**: 50. 1828.

This species has heretofore only been known from Mocino and Sesse's plate (DC. tracing no. 377).

In 1901 the writer had the good fortune to collect a plant in an alpine meadow in Central Mexico which corresponds very closely with the illustration referred to. My exact locality is the Sierra de Pachuca, Hidalgo, and the date July 21 and 22, 1901 (no. 5622).

Lavauxia graminifolia (Lévl.) Rose.

Oenothera graminifolia Lévl. Monog. Onoth. **1**: 42. *pl. 3* [in part]. 1902.

Oenothera brachycarpa var. *stenophylla* Lévl. l. c.

Nearly acaulescent; leaves elongated, linear, 10 to 20 cm. long, 2 to 4 mm. wide, subentire, only slightly pubescent; calyx tube slender, 14 cm. long, appressed-pubescent; petals pinkish, 4 to 4.5 cm. long; capsule rather slender, 2.5 cm. long, pubescent, slightly winged.

Collected by Dr. E. Palmer at Saltillo in 1880 (no. 342). Doctor Watson was inclined to consider this a very narrow-leaved form of *brachycarpa*.

The writer had given a different name and the description was in manuscript before the appearance of Professor Léveillé's monograph. The latter's name must, of course, be taken up, as his material, at least for most part, is the same as mine.

Type locality: "Saltillo, Coahuila."

RAIMANNIA, A NEW GENUS.

Linnaeus, in the first edition of the Species Plantarum, describes three species as belonging to Oenothera, viz, *O. biennis*, *O. mollissima*, and *O. fruticosa*. These species are now believed to be of different genera. In 1835 Spach referred them to Onagra, Oenothera, and Kneiffia, respectively, and this course has been followed by Raimann, Small, Britton, and other recent writers on this group.

Recently Mr. W. F. Wight has informed me that the species *biennis* should be considered the type of Oenothera proper. A careful review of the history of the genus seems to confirm his statement. This being the case, the Onagra of Tournefort, Adanson, and Spach becomes a true synonym of Oenothera L., and our plants commonly called Oenothera are without a name. They can not be merged into Anogra, although some of the reputed Anogras should go with them.

I propose for this genus the name Raimannia, given in honor of Dr. Rudolf Raimann, of Vienna, who had the courage to divide the old genus Oenothera and to place the group on a proper basis.

Type species *R. laciniata* (*Oenothera laciniata* Hill).

The following North American species are recognized:

Raimannia colimae Rose, sp. nov.

A small much-branched plant strikingly resembling *Hartmannia rosea*, somewhat appressed-pubescent and with some spreading hairs; leaves lanceolate, 2 to 3 cm. long, acute, minutely toothed; buds erect or nodding, glabrous except for a few long silky hairs; tips free but short; segments 10 mm. long; tube slender, 3 to 3.5 cm. long; pods sessile, slender, 3 to 4 cm. long; seeds nearly globular, somewhat reticulated.

Collected on the Volcano of Colima, Jalisco, by M. E. Jones, July 14, 1892 (no. 232).

Raimannia confusa Rose, sp. nov.

Stems 40 to 70 cm. high, much branched, more or less purplish, somewhat appressed-pubescent as well as slightly pilose; leaves rather narrow, 2 to 5 cm. long, pinnately cleft; flower buds nodding; calyx segments long-hairy, 12 to 15 mm. long, the free tips very short; the tube slender, about 3 cm. long; petals rose-colored, 14 mm. long; pods terete, sessile, hairy, erect or somewhat spreading, 3 to 4 cm. long; seeds in two rows, reticulated.

Collected by J. N. Rose on the Sierra de Pachuca, July 21, 22, 1901 (no. 5636).

This species is rather common in the Valley of Mexico and on the lower stretches of the neighboring mountains. It has heretofore been confused with *O. sinuata* (now *R. laciniata*), but has a somewhat different appearance and much shorter tips to the calyx-segments, etc.

Raimannia curtissii Rose, sp. nov.

Perennial, comparatively simple, 20 to 80 cm. high; basal leaves narrowly oblanceolate, 5 to 10 cm. long, acute, subentire, runcinately-lobed; stem leaves lanceolate to linear, subentire, acute, clothed with cinereous appressed hairs; inflorescence an interrupted leafy-bracted spike; calyx tube very slender, 2.5 to 3 cm. long; somewhat spotted, nearly glabrous; lobes 1 cm. long, nearly glabrous (but sometimes with a few long hairs and some shorter ones), its tips very short; petals probably white but somewhat purplish in dried specimens, 15 mm. long; capsule cone-shaped, 12 to 14 mm. long, somewhat pubescent; seeds in two rows in each cell.

Collected by A. H. Curtiss in dry open places in Flint River Valley near Bainbridge, Georgia, August 22, 1902 (no. 6880); and probably also by S. M. Tracy at East Pass, Florida, September 1, 1899 (no. 6614).

Raimannia coronopifolia (T. & G.) Rose.

Oenothera coronopifolia T. & G. Fl. N. Am. **1**: 495. 1840.

Anogra coronopifolia Britton, Mem. Torr. Bot. Club **5**: 234. 1894.

Oenothera coronopifolia was referred to Anogra by Doctor Britton in 1894 and this view has since been followed by Small and others. It is true the buds are nodding and the flowers purplish, but it has the fruit of a true Raimannia and requires to be placed in that genus.

Raimannia drummondii (Hook.) Rose.

Oenothera drummondii Hook. Bot. Mag. **61**: *pl. 3361.* 1835.

Raimannia grandis (Britton) Rose.

Oenothera sinuata grandis Britton, Mem. Torr. Bot. Club **5**: 358. 1894:

Oenothera sinuata grandiflora S. Wats. Proc. Am. Acad. **8**: 581. 1873, not *O. grandiflora* Ait. 1789.

Oenothera laciniata grandis Britton in Britton & Brown Illust. Fl. **2**: 487. 1897.

Oenothera laciniata occidentalis Small, Bull. Torr. Bot. Club **23**: 173. 1896.

This western species is very common in the prairie region of eastern Texas. It does not seem to grade into the *O. laciniata* of the eastern United States, being easily distinguished by its few large flowers, long tips to the calyx-segments, and very long stigma lobes, and I have therefore given it specific rank.

Raimannia heterophylla (Spach) Rose.

Oenothera heterophylla Spach, Nouv. Ann. Mus. Par. **4**: 348. 1835.

The old *Oenothera heterophylla* shows considerable variation in the pubescence of the calyx and the length and spread of calyx tips as well as in general habit. The few Texas specimens which I have seen suggest the possibility of a second species but hardly warrant the description of one at this time. The species is often confused in herbaria with *O. rhombipetala*, but the latter is easily recognized by the appressed pubescence on the calyx.

O. bifrons Don belongs here: *O. leona* Buckley, generally referred to *O. heterophylla*, has a nearly glabrous calyx, and this suggests the possibility of its being a good species, but the material in our larger herbaria is still scanty.

Raimannia humifusa (Nutt.) Rose.

Oenothera humifusa Nutt. Gen. **1**: 245. 1818.

Raimannia laciniata (Hill) Rose.

Oenothera laciniata Hill, Syst. Veg. **12**: 64. 1767.

Raimannia littoralis (Schlecht.) Rose.

Oenothera littoralis Schlecht. Linnæa **12**: 268. 1838.

To *R. littoralis* I would refer Pringle's no. 7678, collected on sandy dunes near Tampico, Tamaulipas, April, 1898. Pringle's plant seems to differ from *R. drummondi*, a United States species, in its pubescence and more erect pods.

A somewhat similar plant, but probably distinct, variously treated as a form of *O. drummondi* and *O. sinuata*, has been collected on the coast of Lower California.

Raimannia macrosceles (A. Gray) Rose.

Oenothera macrosceles A. Gray, Mem. Am. Acad. n. ser. **4**: 43. 1849.

Onagra macrosceles Small, Bull. Torr. Bot. Club **23**: 172. 1896.

The *Oenothera macrosceles* Gray is certainly not an Onagra as supposed by Small, for it has ascending ovules and terete seeds, etc.

Raimannia rhombipetala (Nutt.) Rose.

Oenothera rhombipetala Nutt.; T. & G. Fl. N. Am. **1**: 493. 1840.

APIACEAE.

INTRODUCTORY NOTE.

In 1900 Coulter and Rose published a synopsis of the Mexican and Central American Umbelliferae.[a] Since then a number of new species of Eryngium have been published by Mr. W. Botting Hemsley, while descriptions of a number of species belonging to Eryngium and other genera have been drawn up by me from time to time, and are here presented. A few notes regarding rare species are entered and one change of name is made.

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[a] Proc. Washington Acad. Sciences, vol. 1, pp. 111–159, pls. 3–13, 1900.

NEW AND RECENT SPECIES OF ERYNGIUM.

Eryngium crassisquamosum Hemsley, Hook. Ic. **28:** *pl. 2765.* 1903, is based on Seeman's no. 2136, which I have not seen.

Eryngium globosum Hemsley, Hook, Ic. **28:** under *pl. 2765.* 1903.

Type collected by E. W. Nelson near Tepic, Territorio de Tepic, April 9, 1897 (no. 4174).

Type specimen in U. S. National Herbarium (no. 347477).

Eryngium goldmani Hemsley, Hook. Ic. **27:** *pl. 2638.* 1900.

Type collected by E. A. Goldman in the Sierra Madre near Guasarachi, Chihuahua, September 26, 1898 (no. 168).

Type specimen in U. S. National Herbarium (no. 335667).

Eryngium grande Hemsley & Rose, sp. nov. FIGURE 16.

Tall stout perennial, 1 to 1.5 meters high, growing in clumps; stems glabrous, fluted, leafy; basal leaves parallel-nerved, 60 to 100 cm. long, 2 cm. broad, the margin with short stout spinescent lobes usually shorter than the breadth of the leaf; inflorescence elongated, sometimes 40 cm. or so long, containing many short-peduncled heads crowded along the upper part of the stem or sometimes the peduncles elongated, the central one sometimes 20 cm. long; mature heads sometimes 4 cm. high; bracts at the base of the head numerous, linear, entire, strongly nerved, pungent, also decurrent on the peduncle, in one case for the distance of 10 cm.; bractlets pungent, longer than the flowers; sepals ovate, acute; styles very long, 3 or 4 times as long as sepals; surface of fruit without imbricating scales; cross section of seed deeply indented.

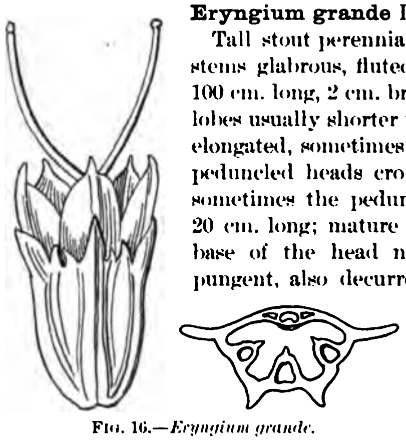

FIG. 16.—*Eryngium grande.*

Specimens examined:

State of Mexico: Nevada de Toluca, J. N. Rose and Jos. H. Painter, October 15, 1903, altitude 3,100 meters (no. 7938, type) near Salazar, Rose and Painter, September 14, 1903 (no. 7031).

State of Jalisco: Volcano of Colima, M. E. Jones, July 13, 1893 (no. 236).

Eryngium guatemalense Hemsley, l. c. under *pl. 2766.* 1903.

First specimen cited, Nelson's no. 3654 from Hacienda de Chancol, Guatemala, at 3,300 meters.

Specimen in U. S. National Herbarium (no. 274013).

Eryngium longispinum Coult. & Rose, Hook. Ic. **28:** under *pl. 2766.* 1903.

Collected by C. G. Pringle on the pedregal in Valley of Mexico (no. 4359).

Eryngium medium Hemsley, Hook. Ic. **28:** *pl. 2767.* 1903.

Type collected by E. W. Nelson near San Julian, Chihuahua, altitude 2,100 to 2,400 meters, September 7, 1898 (no. 4924).

Type specimen in U. S. National Herbarium (no. 330871).

Eryngium palmeri Hemsley, Hook. Ic. **28:** under *pl. 2765.* 1903.

Collected by Dr. E. Palmer at Rio Blanco near Guadalajara, Jalisco, in 1887 (no. 681).

Eryngium painteri Hemsley & Rose, sp. nov. FIGURE 17.

Perennial, with a short somewhat creeping rootstock producing many long black roots; stem rather slender but much stouter than in *E. pringlei*, 30 to 70 cm. tall, glabrous, bearing a few much-reduced leaves; basal leaves numerous, 2 to 3 dm. long, 10 to 15 mm. broad, pungent, parallel-veined, the face somewhat banded, the margins with numerous spinescent linear lobes longer than the breadth of leaf, often bearing prickles in the axils; inflorescence a simple terminal umbel, sometimes more compounded, and the 2 to 5 bract-like leaves below the umbel bearing solitary heads; rays (peduncles) 3 to 7 cm. long, slender; flower parts, bracts, and sometimes the upper leaves more or less deep blue; bracts linear, 1 to 2 cm. long, entire, pungent, about as long as the mature heads; bractlets linear-ovate, pungent, longer than the flowers; sepals ovate, pointed; styles about twice as long as the sepals.

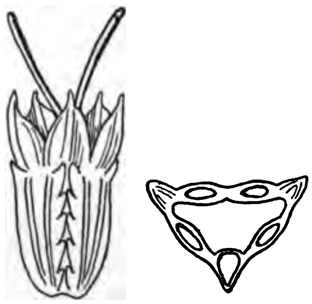
FIG. 17.—*Eryngium painteri.*

The material seen is all from about Pachuca, Hidalgo.

Specimens examined:

Near Real del Monte: J. N. Rose, June 2, 1899 (nos. 4488 and 4489); also Rose and Painter, August 31, 1903 (no. 6660).

On the Sierra de Pachuca: C. G. Pringle, 1898 (no. 6939); also Rose and Hay, July 21 and 22, 1901 (no. 5589) and Rose and Painter, September 1, 1903 (no. 6723, type).

This species is common near the top of mountains growing in the oak and fir forests. Its relationships seem to be with *E. bromeliaefolium* and *E. axillifolium*, but it is more slender and otherwise different.

Eryngium pilularioides Hemsley & Rose, sp. nov. FIGURE 18.

Delicate little annual with slender trailing branches, rooting at the joints; basal leaves linear, hollow, parallel-nerved, 6 to 8 cm. long, entire, or with a few (2 to 4) marginal bristles toward the base, either obtuse or tipped by a short bristle; stem leaves several at each node, somewhat similar to the basal leaves but some at least shorter, bristling at base; stipular sheath with white scarious margins; branches 10 cm. or more long, flowering from the base; heads subsessile or short-peduncled, 3 to 4 mm. in diameter, bracts little exceeding the flowers, entire, linear, or a little broader at base and here scarious-margined; bractlets similar in size and shape to the bracts; sepals short, ovate; styles shorter than the calyx lobes; fruit covered with white ovate papillose scales.

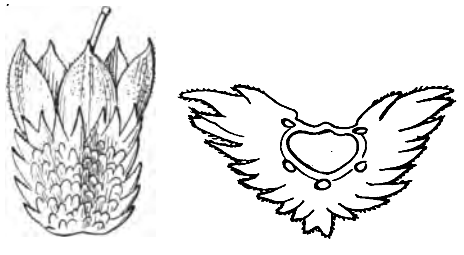
FIG. 18.—*Eryngium pilularioides.*

Collected by C. G. Pringle in shallow hollows of meadows in eastern Hidalgo, 1904 (no. 8948).

This is a very remarkable species, very unlike any material in the National Herbarium. The venation seems to be parallel and therefore of the type of *E. yuccaefolium* as well as of some of the giant species.

Eryngium pringlei Hemsley & Rose, sp. nov. FIGURE 19.

Very slender perennial, 30 to 50 cm. high; basal leaves narrow, 4 to 5 mm. broad, erect, 20 to 30 cm. long, the margin bearing many slender bristles in the lower half, naked above, pungent at tip; stem leaves few, much reduced; heads few, small, less than 1 cm. in diameter, on slender peduncles 2 to 4 cm. long; bracts about 5, 2 to 3 mm. long, ovate-acuminate, serrulate on the margin; bractlets very slender, like the bracts in size and shape, hardly extending beyond the flowers; sepals ovate, acute; styles slender, a third longer than the sepals; fruit about 3 mm. long, covered with small ovate overlapping scales.

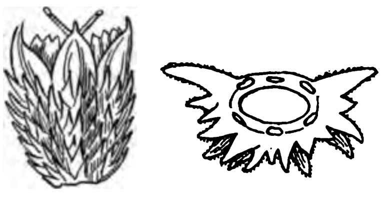

FIG. 19.—*Eryngium pringlei.*

Collected by C. G. Pringle in alkaline meadows, Hacienda de Angostura, San Luis Potosi, July 10, 1891 (no. 3759). Type in U. S. National Herbarium (no. 461279). It was distributed as *E. deppeanum*, from which it differs greatly.

Eryngium puberulentum Hemsley & Rose, sp. nov.

Perennial from a slender rootstock; stems slender, 90 to 100 cm. high, nearly simple, rather pale; basal and lower stem leaves long and narrow (60 cm. long by 4 to 8 mm. broad), the margin bearing paired unequal setæ closely set in the lower part, more distinct above; inflorescence a simple or somewhat compounded umbel; rays (peduncles) usually slender, about 3 cm. long; heads globular, 5 to 6 mm. in diameter; bracts 5 or 6, ovate, acute, small, 3 mm. long; bractlets similar, puberulent; sepals broadly ovate, mucronate; styles elongated.

Collected by C. G. Pringle in the Sierra Madre above Monterey, Nuevo Leon, August, 1903 (no. 11461, type) and by Dr. E. Palmer in the Caracol Mountains southeast of Monclova in 1880. Doctor Palmer's plant was distributed as "*E. yuccaefolium* var !" under which name it has ever since rested.

Eryngium stenolobum Hemsley, Hook. Ic. **28**: under *pl. 2766.* 1903.

Collected by Rose and Hough near Cuernavaca, Morelos, in 1899 (no. 4393).

Type specimen in U. S. National Herbarium (no. 346355).

Eryngium watsoni Coulter & Rose, sp. nov.

Rather slender perennials, very pale but not glaucous, 30 to 40 cm. high, somewhat branching above; basal and lower stem leaves elongated, linear, 60 to 70 cm. long, 10 to 12 mm. broad, parallel-veined, banded down the center, the margin bearing short weak spines; inflorescence a compound umbel or an umbel-like cluster; heads oblong in outline, 12 mm. long; bracts few, linear-ovate, about 7 mm. long, usually entire, pungent, strongly 3-nerved; bracts similar but smaller; sepals ovate, acute; styles slender, 3 times as long as the sepals.

Collected by C. G. Pringle in mountains near Lake Chapala, Jalisco, October 18, 1895 (no. 6197). Type specimen in U. S. National Herbarium (no. 244270).

This species although long ago recognized as new has remained unpublished. In the meantime several other species have been confused with it. Mr. W. B. Hemsley suggests a relationship with *E. longifolium* Cav.

FIVE NEW SPECIES OF PRIONOSCIADIUM.

Prionosciadium diversifolium Rose, sp. nov.

Perennial, 1 to 2 meters high, loosely branching, glabrous and somewhat glaucous below; leaves ternately divided; rachis winged, either entire or toothed; leaflets ovate, acute or obtuse, 8 cm. or less long, sharply serrate, glabrous except a little scabrosity along the veins; peduncle short (3 to 6 cm. long), slender; involucre none; involucel bractlets few, linear, about the length of the fruiting pedicels; rays about equal, 2 cm. long, scabrous; pedicels 2 or 3 mm. long; fruit oblong, 10 mm. long, glabrous.

Collected by Mr. C. G. Pringle on mountains above Iguala, Guerrero, September 14, 1900 (no. 8420).

The detached leaves vary so much in shape and toothing of the leaflets and in the character of the rachis as to suggest two species. Mr. Pringle, however, is very confident that we have but one. In case there is a mixture the leaf with obtuse segments is to be excluded. In its thin leaves and winged rachis this much resembles *P. acuminata*, but in several other respects it is very different.

Prionosciadium moschatum Rose, sp. nov.

Tall perennial, 1 to 3 meters high, much branched; leaves large, ternately divided, the main and secondary branches not winged; segments oblong, each confluent at base with its mate forming a wedge-shaped projection down the rachis, somewhat scabrous, very decidedly so beneath, and with crenate mucronate teeth; inflorescence much branched and crowded; umbels small on short (2 to 5 cm. long) often verticillate peduncles; peduncle, rays, pedicels and fruit more or less roughened; involucre wanting; involucel bractlets several, linear, longer than the pedicels; rays 1 to 2 cm. long; pedicels 2 mm. long; fruit seen immature, scabrous on the ribs.

The species is nearest *P. mexicanum*, but the fruit is roughened, etc.

Collected by J. N. Rose near Chalchicomula, Puebla, at the base of Mount Orizaba, July 24, 1901 (no. 5664).

This species, like many species of the Arracacias, has a strong odor of musk.

Prionosciadium palustre Rose, sp. nov.

Perennial, caulescent, 1 to 2 meters high, glabrous throughout; basal leaves ternately divided, the rachis evenly winged to the very base; wing thin and entire; segment rather small, 3 to 6 cm. long, ovate, with an entire cuneate base, acuminate, sharply serrate; pedicels very short, 1 to 3 cm. long; involucre bracts 1 to several, sometimes linear, sometimes resembling reduced leaves; involucel bractlets several, linear, somewhat longer than the pedicels; rays short, 10 mm. or less long; pedicels 2 or 3 mm. long; fruit broadly oblong, 8 to 10 mm. long, glabrous, rounded at apex, cordate at base; wings as broad as body; oil tubes 2 or 3 in the interval, 4 to 6 on the ventral surface; stylopodium none; seed face deeply concaved.

Collected by J. N. Rose and Jos. H. Painter in swamp near Yautepec, Morelos, August 27, 1903 (no. 6555).

Somewhat resembling *P. acuminatum*, but still very different.

Prionosciadium seleri Rose, sp. nov.

Doubtless a tall branching perennial, but no data given by collector; basal leaves twice ternate, then pinnate, the main rachis and primary branches not winged, the leaflets more or less confluent at base, the pubescence on both sides but more abundant beneath, consisting of very short, stiff yellow hairs; leaflets obtuse, serrate; inflorescence consisting of many short-peduncled umbels, either opposite or verticillate, pedicels very short; fruit seen immature, glabrous.

Collected by C. and E. Seler in Guatemala, June 10, 1896 (no. 3106).

This species seems to belong to the *P. pringlei* type.

Prionosciadium townsendi Rose, sp. nov.

Stems 150 cm. high, glabrous and pale; leaves broad, ternate then pinnate (in all specimens seen), the alternate segments or pinnae more or less confluent and tapering below into a more or less winged and toothed rachis; leaflets lanceolate, acute, sharply and finely serrate, sometimes 8 cm. long and 3 cm. broad; umbels numerous and verticillate, sometimes only 3 to 10 cm. long; rays numerous, about equal, 2 to 4 cm. long; pedicels 5 to 6 mm. long; rays and pedicels a little scabrous; involucels of numerous linear bractlets; fruit glabrous, narrowly oblong, 11 to 12 mm. long, 6 mm. broad, wings about as broad as body, strongly notched at base.

Collected by C. H. Tyler Townsend and C. M. Barber (no. 381), in the Sierra Madre, 20 miles southwest of Chuichupa, Chihuahua, August 29, 1899.

Perhaps nearest *P. pringlei*, but glabrous, with different leaflets, etc.

NEW SPECIES OF SEVERAL GENERA.

Ammoselinum popei (T. & G.) Gray, has not been collected in Mexico for many years. It has recently been found again by Mr. C. G. Pringle (no. 8315) near Diaz, on the northern border.

Arracacia humilis Rose, sp. nov.

Stems herbaceous, the lower portion spreading and more or less imbedded in humus and undergrowth, glabrous throughout; leaves twice ternate; leaflets ovate, more or less lacerate and sharply, almost spinulosely-toothed, pale and somewhat glaucescent, 1 to 2.5 cm. long; peduncles slender, overtopping the leaves, 10 to 20 cm. long; rays 8 to 10, fruiting ones few, nearly erect, slender, about 5 cm. long; involucre wanting; involucel bractlets several, longer than the pedicels, narrow, 3-cleft near the apex; pedicels stout, 3 to 4 mm. long; fruit ovate, 4 mm. long, rounded at the base; stylopodium low.

Collected by C. and E. Seler in mountain woods between Totonocapan and Los Encuentros, Guatemala, September 25, 1896 (no. 2342).

Near *A. brevipes*, but with foliage, involucel bracts, etc., glabrous.

Coulterophytum holwayi Rose, sp. nov.

Perennial with tall stems woody at base; leaves large, the main branches 30 to 40 cm. long, ternate, then twice pinnate; leaflets ovate, long-acuminate, petioled or sessile, 5 to 12 cm. long, 2.5 to 5 cm. broad at widest point, cuneate, rounded or even broadly cordate at base, dark green above and glabrate, densely cinereous-puberulent beneath, sharply serrate; stipular sheath large, inflated; inflorescence of numerous slender short (4 to 8 cm. long) peduncles, variously angled; involucel bracts linear, shorter than the pedicels (4 to 5 mm. long); ovary puberulent; fruit seen immature.

Collected by E. W. D. Holway near Zapotlan, Jalisco, October 9, 1903 (no. 5138).

Hydrocotyle yucatanensis Millsp. Bot. Field Col. Mus. 2: 81. 1900, seems not to differ from true *H. bonariensis*.

Ligusticum madrense Rose, sp. nov.

Stems 60 to 90 cm. high, glabrous; basal leaves rather small, somewhat narrow in outline, once or twice ternate, then once to twice pinnate; leaflets ovate, sometimes merely toothed, at other times cut into linear lobes, somewhat scabrous on the margins; umbels terminal and axillary, apparently never verticillate, 1 to 2 dm. long, somewhat scabrous at the top (as are the rays and pedicels throughout); rays numerous, about equal, 3 to 7 cm. long; pedicels slender, 8 to 15 mm. long; involucre wanting; involucel consisting of several filiform elongated bractlets; fruit seen immature, glabrous.

Collected by C. H. Tyler Townsend and C. M. Barber, in the Sierra Madre, 5 miles southeast of Colonia Garcia, Chihuahua, September 23, 1899 (no. 350).

This species is quite different from the two other North Mexican species (*L. goldmani* and *L. nelsoni*) in its foliage and involucel bractlets.

Museniopsis arguta Rose, sp. nov.

Perennials from elongated thickened roots, 40 to 50 cm. high, slender, glabrous, somewhat glaucous, purplish below, somewhat branching above; leaves mostly basal, bipinnate or ternate-pinnate, the lower pair of segments elongated; leaflets on segments ovate, the terminal ones more elongated, acute, 1 to 3 cm. long, sharply serrate, the larger ones first cut or cleft and then serrate, slightly scabrous on the veins; petioles about the length of the blade; upper leaves somewhat similar but reduced, the uppermost bract-like, linear or of linear lobes; peduncles slender 6 to 10 cm. long; rays 5 to 10, nearly equal, 15 to 25 mm. long; involucel bractlets 3 or 4, filiform, longer than the pedicels (2 mm. long); fruit ovate, cordate at base, 3.5 mm. long, glabrous, flattened laterally; carpels with 5 filiform ribs, rather conspicuous; oil tubes

3 in an interval, sometimes fewer in lateral ones, 6 on commissural side; seed strongly involute; stylopodium low-conical.

This species closely resembles *M. serrata* C. & R., but has less scabrous leaves and different fruit, and possesses involucel bractlets, etc.

Collected by Mr. C. G. Pringle on a rocky hillside about the waterfall near El Oro, Michoacan, September 13, 1901 (no. 6812).

Museniopsis fusiformis Rose, sp. nov.

Biennials from small spindle-shaped tubers, stems glabrous, much branched, 40 cm. high, not at all zigzag; leaves 2 to 3 times ternate; leaflets linear, entire; rays usually 4 to 10, nearly equal, 1 to 2 cm. long; pedicels about 3 mm. long; involucre of one or two bracts; involucel bractlets if present one or two and linear; flowers yellow; fruit 2 mm. long, cordate at base; ribs of fruit rather prominent.

Collected by J. N. Rose and Jos. H. Painter, October 13, 1903 (no. 7821, type), near Tultenango canyon, State of Mexico; and by Mr. C. G. Pringle at same locality (no. 9815).

This species comes nearest *M. tuberosa*, but is stouter throughout, often possesses an involucre and involucel bractlets, has stouter ribs, etc.

Oaxacana ebracteata Rose, sp. nov.

Stems tall, 60 or more cm. high, erect, glabrous and glaucous; upper leaves twice ternate; leaflets ovate, acute, more or less cleft and sharply serrate; petioles wanting, stipular bases much enlarged and scarious; peduncles short, 7 to 8 cm. long; rays numerous, spreading, 3 to 4 cm. long; involucre and involucel bractlets wanting; flowers purplish, the sterile ones on slender pedicels, the fruiting ones very short or subsessile.

Collected by C. and E. Seler between Hurtztan and Oxchuc, Chiapas, March 11, 1896 (no. 2148).

Spermolepis echinatus (Nutt.) Heller, should now be taken up for *Leptocaulis echinatus* Nutt.

Mr. C. G. Pringle has recently collected material at Diaz, Coahuila (no. 8309).

Washingtonia mexicana (Griesb.) Rose.

Osmorrhiza mexicana Griesb. Goett. Abh. **24**: 147. 1879.

Washingtonia mexicana has a wide distribution in the mountains of Mexico.

CUCURBITACEAE.

TWO NEW SPECIES.

Roseanthus elongatus Rose, sp. nov.

Annual vine, climbing to 4.5 to 6 meters, monœcious, the stem somewhat angled, pubescent; leaves ovate, cordate, with a broad generally open sinus, sometimes 3-lobed, 15 cm. long, thin, acute, the margin with fine but distinct teeth, pubescent on both surfaces; male flowers abundant, axillary on long slender peduncles (20 cm. or so long), 7 to 8 cm. broad; corolla white with numerous greenish veins; female flowers on short peduncles (1 to 1.5 cm. long), very pilose and also covered with short glandular hairs; calyx tube greenish, 4 cm. long; lobes linear, 10 to 12 mm. long; ovary pubescent; fruit globular, 5 cm. in diameter, its rind thin and splitting irregularly; seeds horizontal, separated from one another by thin tough plates.

Very common on the western slopes of the Cape region of Lower California. Collected by T. S. Brandegee first in September, 1893, and again in November, 1902. Type in Brandegee Herbarium.

Schizocarpum jaliscanum Rose, sp. nov.

A delicate vine, climbing over low bushes and shrubs, the stems bearing pilose as well as short glandular hairs; leaves orbicular in outline, with broad open sinus, the basal lobes rounded, the apex rounded or acutish, nearly glabrous above, scabrous-pubescent beneath; male flowers yellow, trumpet-shaped, 4 to 6 cm. long, on peduncles 6 to 12 cm. long; the lobes obtuse; female flowers somewhat smaller than the male flowers on peduncles 3 to 10 mm. long; fruit 4 cm. long.

Very common in the hot valley of Bolaños River, near Bolaños. Collected by J. N. Rose, September 10 to 19, 1897 (no. 2851).

A SYNOPSIS OF THE MEXICAN SPECIES OF RIBES.

[Continued from page 301.]

The following additional notes on Mexican Ribes are based on information received too late for incorporation into the body of my paper on Ribes:

Through the kindness of Dr. I. Urban, I have had an opportunity to examine fragments from the type material of all of Humboldt's Mexican species except the now well known *R. microphyllum.* The examination of these specimens in the light of the abundant material in the National Herbarium clears up several points which have long been misunderstood. The various names based on Humboldt's material will be taken up alphabetically.

Ribes affine H. B. K. is best represented in our collection by specimens distributed by Pringle as *R. multiflorum* and others collected by myself near the type locality. In the type specimen the petioles are clothed with soft hairs, and bear a few stalked glands on the stipular base only; the calyx tube is very short; the pedicels are without glands of any kind, but the bracts and bractlets bear stalked glands. None of the National Museum material, however, has stalked glands on the bracts and bractlets. A larger series of specimens must yet be collected before the limits of this species are clearly made out. For the reason mentioned below, the reference by the Kew Index of this species to *R. campanulatum* would not be warranted even if the two were the same.

Ribes campanulatum H. B. K. was treated by Kunth as a synonym of his *R. affine*, and has ever since been considered the same as that species. A careful examination of Willdenow's No. 4859, the type of *R. campanulatum* H. B. K., seems to indicate that this species is the same as my *R. pringlei.* The petioles have stalked glands, as also the upper surface of the leaf blade; the ovary is glandular, and the flowers were apparently large. In all these respects it differs from *R. affine* and corresponds with *R. pringlei.* The name, however, is a homonym, and therefore does not invalidate my new name. An interesting fact, stated in connection with the original publication of *R. campanulatum*, which seems to have been overlooked, throws some light on this point. It is stated that this species was collected with *R. ciliatum*, which came from the State of Michoacan, while if it had been with *R. affine* it would have come from the central part of the State of Hidalgo. *R. campanulatum* is a homonym of a much earlier name, as is shown on page 298.

Ribes ciliatum H. & B. is well represented in the National Herbarium by Pringle's No. 4255 from the volcano of Toluca. The petiole has short stalked glands and short close pubescence; the upper surface is nearly smooth, except for some stalked glands, which are also found on the tips of the teeth, while the under surface has many sessile glands and much pubescence on the nerves. The material here described is a part of Willdenow's No. 4860.

Ribes kunthii Berland. was made because *R. multiflorum* H. B. K. was found to be a homonym of a much earlier name. If *R. multiflorum* is a good species it must bear the name of *R. kunthii.*

Ribes jorullense H. B. K. seems to be the same as *R. ciliatum.* This was the conclusion of Kunth, and I believe has never been questioned. Humboldt's specimen in the general Berlin herbarium seems to be identical with Willdenow's No. 4860. *R. jorullense* is more recent than *R. ciliatum* and therefore goes properly into synonomy. It was retained however in the Biologia Centrali-Americana.

Ribes mexicanum Spreng. was made because *R. multiflorum* H. B. K. was found to be a homonym. *R. kunthii*, however, has a priority of one year, and therefore *R. mexicanum* becomes a synonym of that species.

Ribes multiflorum H. B. K. is a very peculiar species. In the type specimen, our only source of information, the inflorescence seems to be abnormal, having the two bractlets alternate and distant from the summit of the pedicels and the raceme itself compounded. Its flowers suggest *R. affine*, but besides differences in the inflorescence the petioles have stalked glands. If it is a good species it must take the name *R. kunthii*, otherwise it must be considered an aberrant form of *R. affine*.

Ribes orizabae Rose, sp. nov.

Leaves 2 to 4 cm. long, ovate in outline, 3-lobed, or sometimes 5-lobed, the central lobes usually longer, acute, glabrous above but with sessile glands when young, pubescent on the veins beneath and with some sessile glands, the margins with gland-tipped hairs, doubly serrate; petiole 1 to 2.5 cm. long, with scanty soft pubescence and subsessile glands, its stipular base considerably enlarged and ciliate with long glandular hairs; racemes drooping, many-flowered; bracts about the length of the pedicels, lanceolate, linear, the margins fringed with simple and glandular hairs, the lower ones toothed; pedicels only slightly pubescent, soon glabrate, never glandular; bractlets caducous, not seen; ovary glabrous; calyx pubescent without, including the lobes, 6 mm. long, its lobes nearly 4 mm. long and obtuse.

Collected by Fred. Muller at Orizaba in 1853 (no. 637?). Type in Gray herbarium, fragment and photograph in United States National Herbarium. This specimen belonged to the John Ball herbarium, which went to the Gray herbarium in 1890.

This species differs from *R. affine* in having the upper surface of the leaves perfectly glabrous, the teeth sharper, the margin bearing gland-tipped hairs, the lower bracts toothed, the pedicels much less pubescent, the stipular base larger, with longer fibrillae. If this plant came from near Orizaba City it is found at a much lower altitude than the true *R. affine*.

Ribes grande Rose, sp. nov.

A large bush 2 to 3 meters high; first-year branches dark blue, then reddish, or very vigorous ones grayish brown, clothed with short soft pubescence and with scattered sessile glands, as also the petioles and inflorescence; petioles bearing stalked glands on the stipular base; leaves nearly orbicular in outline, 3 to 5-lobed, the two lateral lobes always small or indistinct, all of them rounded at apex, doubly crenate, glabrate above, softly pubescent beneath, bearing sessile glands on both surfaces; inflorescence either simple or branched; bracts large and foliaceous, the lower ones toothed and much longer than the pedicels, the upper ones entire, all ciliate and glandular; bractlets linear-lanceolate, pubescent and glandular, borne on the pedicel above the middle; calyx lobes broad, but longer than the tube, pubescent; petals broader than long; ovary glabrous; fruit bluish black.

Along the roadside above Chalchacomula, Puebla, on the way to Mount Orizaba, collected by J. N. Rose, July 24, 1901 (no. 5656).

This species is perhaps nearest *R. affine*, but the lobes of the leaves are more rounded, the calyx tube longer than its lobes, etc.

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